University Hospitals Bristol NHS
NHS Foundation Trust

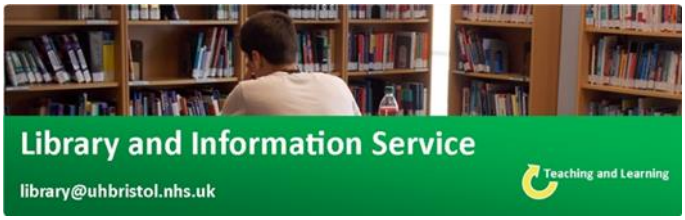
Infection Control

Evidence Update

Summer 2017

(Quarterly)

Respecting everyone
Embracing change
Recognising success
Working together
Our hospitals.



Lunchtime Drop-in Sessions

All sessions last one hour

July (13.00-14.00)

3rd (Mon) Interpreting Statistics
12th (Wed) Critical Appraisal
21st (Fri) Literature Searching
26th (Wed) Interpreting Statistics

August (12.00-13.00)

4th (Fri) Critical Appraisal
9th (Wed) Literature Searching
15th (Tues) Interpreting Statistics
24th (Thurs) Critical Appraisal

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Contents

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Updates

NICE National Institute for Health and Care Excellence

ES13: Preventing recurrence of Clostridium difficile infection: bezlotoxumab

Summary of the evidence on bezlotoxumab for preventing the recurrence of Clostridium difficile (C difficile) infection

Evidence summary Published June 2017

https://www.nice.org.uk/advice/es13/chapter/Key-points

Photo at Discharge (PaD): Improving information to patient and carers reduces readmission for incisional surgical site infection

...prevention and treatment (CG74) Surgical site infection (QS49) Category Does the...the wound shows signs of surgicalsite infection (SSI) or deterioration To...managing readmissions for surgical site infection. We used indirect patient...

Shared learning Published June 2017

https://www.nice.org.uk/sharedlearning/photo-at-discharge-pad-improving-information-to-patient-and-carers-reduces-readmission-for-incisional-surgical-site-infection

Global guidelines on the prevention of surgical site infection.

World Health Organization, November 2016. 184 pages
http://www.who.int/gpsc/ssi-prevention-guidelines/en/

Cochrane Library

Liu Z, Norman G, Iheozor-Ejiofor Z, Wong JKF, Crosbie EJ, Wilson P. **Nasal decontamination for the prevention of surgical site infection in *Staphylococcus aureus* carriers**. Cochrane Database of Systematic Reviews 2017, Issue 5. Art. No.: CD012462. DOI: 10.1002/14651858.CD012462.pub2.

http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD012462.pub2/full

Dumville JC, Norman G, Westby MJ, Blazeby J, McFarlane E, Welton NJ, O'Connor L, Cawthorne J, George RP, Liu Z, Crosbie EJ. **Intra-operative interventions for preventing surgical site infection: an overview of Cochrane reviews (Protocol).** Cochrane Database of Systematic Reviews 2017, Issue 5. Art. No.: CD012653. DOI: 10.1002/14651858.CD012653.

http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD012653/full

Beyar-Katz O, Dickstein Y, Borok S, Vidal L, Leibovici L, Paul M. **Empirical antibiotics targeting gram-positive bacteria for the treatment of febrile neutropenic patients with cancer**. Cochrane Database of Systematic

Reviews 2017, Issue 6. Art. No.: CD003914. DOI: 10.1002/14651858.CD003914.pub4.

http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD003914.pub4/full

van Driel ML, De Sutter AIM, Habraken H, Thorning S, Christiaens T. **Different antibiotic treatments for group A streptococcal pharyngitis.** Cochrane Database of Systematic Reviews 2016, Issue 9. Art. No.: CD004406. DOI: 10.1002/14651858.CD004406.pub4.

http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD004406.pub4/full

Cohen JF, Bertille N, Cohen R, Chalumeau M. **Rapid antigen detection test for group A streptococcus in children with pharyngitis**. Cochrane Database of Systematic Reviews 2016, Issue 7. Art. No.: CD010502. DOI: 10.1002/14651858.CD010502.pub2.

http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD010502.pub2/full

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OpenAthens login required. Register here: https://openathens.nice.org.uk/

Bronchiolitis in infants and children: Treatment, outcome, and prevention

Authors: Pedro A Piedra, MD; Ann R Stark, MD; Section Editors: George B Mallory, MD; Morven S Edwards, MD; Deputy Editor: Mary M Torchia, MD

All topics are updated as new evidence becomes available and our peer review process is complete.

Literature review current through: May 2017. | **This topic last updated:** May 25, 2017.

https://www.uptodate.com/contents/bronchiolitis-in-infants-and-children-treatment-outcome-and-prevention?source=related_link

Overview of control measures for prevention of surgical site infection in adults

Authors: Deverick J Anderson, MD, MPH; Daniel J Sexton, MD; Section Editor: Russell S Berman, MD

Deputy Editors: Elinor L Baron, MD, DTMH; Kathryn A Collins, MD, PhD, FACS

All topics are updated as new evidence becomes available and our peer review process is complete.

Literature review current through: May 2017. | **This topic last updated:** Jun 06, 2017.

https://www.uptodate.com/contents/overview-of-control-measures-for-prevention-of-surgical-site-infection-in-adults?source=search_result&search=surgical%20site%20infection&selectedTitle=2~150

Antimicrobial prophylaxis for prevention of surgical site infection in adults

Authors: Deverick J Anderson, MD, MPH; Daniel J Sexton, MD; Section Editor: Anthony Harris, MD, MPH

Deputy Editor: Elinor L Baron, MD, DTMH

All topics are updated as new evidence becomes available and our peer review process is complete.

Literature review current through: May 2017. | **This topic last updated:** Jun 26, 2017.

https://www.uptodate.com/contents/antimicrobial-prophylaxis-for-prevention-of-surgical-site-infection-in-adults?source=related_link

Group A streptococcal tonsillopharyngitis in children and adolescents: Clinical features and diagnosis

Author: Ellen R Wald, MD; Section Editors: Morven S Edwards, MD; Anna H Messner, MD

Deputy Editor:Mary M Torchia, MD

All topics are updated as new evidence becomes available and our peer review process is complete.

Literature review current through: May 2017. | **This topic last updated:** Jun 07, 2017.

https://www.uptodate.com/contents/group-a-streptococcal-tonsillopharyngitis-in-children-and-adolescents-clinical-features-and-diagnosis?source=search_result&search=group%20a%20strep&selectedTitle=2~150

Treatment and prevention of streptococcal tonsillopharyngitis

Author: Michael E Pichichero, MD; Section Editors: Daniel J Sexton, MD; Morven S Edwards, MD

Deputy Editor: Sheila Bond, MD

All topics are updated as new evidence becomes available and our peer review process is complete.

Literature review current through: May 2017. | **This topic last updated:** Feb 16, 2017.

https://www.uptodate.com/contents/treatment-and-prevention-of-streptococcal-tonsillopharyngitis?source=search_result&search=group%20a%20strep&selectedTitle=3~150

Pregnancy-related group A streptococcal infection

Authors: Dennis L Stevens, MD, PhD; Amy Bryant, PhD; Section Editor: Daniel J Sexton, MD

Deputy Editor: Elinor L Baron, MD, DTMH

All topics are updated as new evidence becomes available and our peer review process is complete.

Literature review current through: May 2017. | **This topic last updated:** Jun 22, 2017.

https://www.uptodate.com/contents/pregnancy-related-group-a-streptococcal-infection?source=search_result&search=group%20a%20strep&selectedTitle=6~150

Differential diagnosis of microbial foodborne disease

Author: David WK Acheson, MD, FRCP; Section Editor: Stephen B Calderwood, MD; Deputy Editor: Allyson Bloom, MD

All topics are updated as new evidence becomes available and our peer review process is complete.

Literature review current through: May 2017. | **This topic last updated:** May 08, 2017.

https://www.uptodate.com/contents/differential-diagnosis-of-microbial-foodborne-disease?source=search_result&search=salmonella&selectedTitle=5~150

Nontyphoidal Salmonella: Microbiology and epidemiology

Author: Elizabeth L Hohmann, MD; Section Editor: Stephen B Calderwood, MD;

Deputy Editor: Allyson Bloom, MD

All topics are updated as new evidence becomes available and our peer review process is complete.

Literature review current through: May 2017. | **This topic last updated:** Sep 09, 2016.

https://www.uptodate.com/contents/nontyphoidal-salmonella-microbiology-and-epidemiology?source=search_result&search=salmonella&selectedTitle=4~150

Microbiology, pathogenesis, and epidemiology of Campylobacter infection

Author: Ban M Allos, MD; Section Editors: Stephen B Calderwood, MD; Sheldon L Kaplan, MD

Deputy Editor:Allyson Bloom, MD

All topics are updated as new evidence becomes available and our peer review process is complete.

Literature review current through: May 2017. | **This topic last updated:** May 19, 2017.

https://www.uptodate.com/contents/microbiology-pathogenesis-and-epidemiology-of-campylobacter-infection?source=search_result&search=campylobacter&selectedTitle=2~150

Clinical manifestations, diagnosis, and treatment of Campylobacter infection

Author: Ban M Allos, MD; Section Editor: Stephen B Calderwood, MD; Deputy Editor: Allyson Bloom, MD

All topics are updated as new evidence becomes available and our peer review process is complete.

Literature review current through: May 2017. | **This topic last updated:** Apr 13, 2017.

https://www.uptodate.com/contents/clinical-manifestations-diagnosis-and-treatment-of-campylobacter-infection?source=related_link

Current Awareness Database Articles

Below is a selection of articles recently added to the healthcare databases, grouped in the following categories:

- **C Difficile**
- **Bronchiolitis**
- **RSV**
- **Surgical Site Infection**
- **Group A Strep**
- **Salmonella**
- **Campylobacter**

If you would like any of the following articles in full text, or if you would like a more focused search on your own topic, then get in touch: library@uhbristol.nhs.uk

C Difficile

1. Effect of antibiotic stewardship on the incidence of infection and colonisation with antibiotic-resistant bacteria and Clostridium difficile infection: a systematic review and meta-analysis.

Author(s): Baur, David; Gladstone, Beryl Primrose; Burkert, Francesco; Carrara, Elena; Foschi, Federico; Döbele, Stefanie; Tacconelli, Evelina

Source: The Lancet. Infectious diseases; Jun 2017

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28629876

Abstract:BACKGROUNDAntibiotic stewardship programmes have been shown to reduce antibiotic use and hospital costs. We aimed to evaluate evidence of the effect of antibiotic stewardship on the incidence of infections and colonisation with antibiotic-resistant bacteria.METHODSFor this systematic review and meta-analysis, we searched PubMed, the Cochrane Database of Systematic Reviews, the Cochrane Central Register of Controlled Trials, and Web of Science for studies published from Jan 1, 1960, to May 31, 2016, that analysed the effect of antibiotic stewardship programmes on the incidence of infection and colonisation with antibiotic-resistant bacteria and Clostridium difficile infections in hospital inpatients. Two authors independently assessed the eligibility of trials and extracted data. Studies involving long-term care facilities were excluded. The main outcomes were incidence ratios (IRs) of target infections and colonisation per 1000 patient-days before and after implementation of antibiotic stewardship. Meta-analyses were done with random-effect models and heterogeneity was calculated with the I2 method.FINDINGSWe included

32 studies in the meta-analysis, comprising 9 056 241 patient-days and 159 estimates of IRs. Antibiotic stewardship programmes reduced the incidence of infections and colonisation with multidrug-resistant Gram-negative bacteria (51% reduction; IR 0·49, 95% CI 0·35-0·68; p<0·0001), extended-spectrum β-lactamase-producing Gram-negative bacteria (48%; 0·52, 0·27-0·98; p=0·0428), and meticillin-resistant Staphylococcus aureus (37%; 0·63, 0·45-0·88; p=0·0065), as well as the incidence of C difficile infections (32%; 0·68, 0·53-0·88; p=0·0029). Antibiotic stewardship programmes were more effective when implemented with infection control measures (IR 0·69, 0·54-0·88; p=0·0030), especially hand-hygiene interventions (0·34, 0·21-0·54; p<0·0001), than when implemented alone. Antibiotic stewardship did not affect the IRs of vancomycin-resistant enterococci and quinolone-resistant and aminoglycoside-resistant Gram-negative bacteria. Significant heterogeneity between studies was detected, which was partly explained by the type of interventions and co-resistance patterns of the target bacteria.INTERPRETATIONAntibiotic stewardship programmes significantly reduce the incidence of infections and colonisation with antibiotic-resistant bacteria and C difficile infections in hospital inpatients. These results provide stakeholders and policy makers with evidence for implementation of antibiotic stewardship interventions to reduce the burden of infections from antibiotic-resistant bacteria.FUNDINGGerman Center for Infection Research.

2. Risk factors for Clostridium difficile infections - an overview of the evidence base and challenges in data synthesis.

Author(s): Eze, Paul; Balsells, Evelyn; Kyaw, Moe H; Nair, Harish

Source: Journal of global health; Jun 2017; vol. 7 (no. 1); p. 010417

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28607673

Available in full text at Journal of Global Health - from EBSCOhost

Abstract:BACKGROUNDRecognition of a broad spectrum of disease and development of Clostridium difficile infection (CDI) and recurrent CDI (rCDI) in populations previously considered to be at low risk has renewed attention on differences in the risk profile of patients. In the absence of primary prevention for CDI and limited treatment options, it is important to achieve a deep understanding of the multiple factors that influence the risk of developing CDI and rCDI.METHODSWe conducted a review of systematic reviews and meta-analyses on risk factors for CDI and rCDI published between 1990 and October 2016.RESULTS22 systematic reviews assessing risk factors for CDI (n = 19) and rCDI (n = 6) were included. Meta-analyses were conducted in 17 of the systematic reviews. Over 40 risk factors have been associated with CDI and rCDI and can be classified into three categories: pharmacological risk factors, host-related risk factors, and clinical characteristics or interventions. Most systematic reviews and meta-analyses have focused on antibiotic use (n = 8 for CDI, 3 for rCDI), proton pump inhibitors (n = 8 for CDI, 4 for rCDI), and histamine 2 receptor antagonists (n = 4 for CDI) and chronic kidney disease (n = 4 for rCDI). However, other risk factors have been assessed. We discuss the state of the evidence, methods, and challenges for data synthesis.CONCLUSIONSeveral studies, synthesized in different systematic review, provide valuable insights into the role of different risk factors for CDI. Meta-analytic evidence of association has been reported for factors such as antibiotics, gastric acid suppressants, non-selective NSAID, and some co-morbidities. However, despite statistical significance, issues of high heterogeneity, bias and confounding remain to be addressed effectively to improve overall risk estimates. Large, prospective primary studies on risk factors for CDI with standardised case definitions and stratified analyses are required to develop more accurate and robust estimates of risk effects that can inform targeted-CDI clinical management procedures, prevention, and research.

3. Association of Gastric Acid Suppression With Recurrent Clostridium difficile Infection: A Systematic Review and Meta-analysis.

Author(s): Tariq, Raseen; Singh, Siddharth; Gupta, Arjun; Pardi, Darrell S; Khanna, Sahil

Source: JAMA internal medicine; Jun 2017; vol. 177 (no. 6); p. 784-791

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28346595

Abstract: ImportanceGastric acid suppression has been associated with an increased risk of primary Clostridium difficile infection (CDI), but the risk of recurrent CDI in patients taking gastric acid suppressant medications is unclear.ObjectiveTo perform a systematic review and meta-analysis to evaluate the association between gastric acid suppressants and recurrent CDI.Data SourcesMEDLINE, EMBASE, the Cochrane Central Register, the Cochrane Database, and Web of Science were searched from January 1, 1995, to September 30, 2015, for studies assessing the association between gastric acid suppressant exposure and recurrent CDI. Search terms included Clostridium difficile, pseudomembranous colitis, proton pump inhibitor, and histamine H2 blocker.Study SelectionCase-control studies, cohort studies, and clinical trials that included patients with CDI who did or did not receive gastric acid suppressant therapy and who were evaluated for recurrent CDI were included, with no restriction on study setting (inpatient or outpatient).Data Extraction and SynthesisThe Newcastle-Ottawa scale was used to assess the methodologic quality of included studies. In this scale, case-control and cohort studies were scored on selection, comparability, and ascertainment of the outcome of interest. Data were independently abstracted to a predetermined collection form by 2 investigators. Summary odds ratio estimates with 95% CIs were calculated using the random-effects model and software to calculate the pooled effect size of studies reporting multivariate analyses.Main Outcomes and MeasuresRisk of recurrent infection in patients with CDI and its association with use of gastric acid suppressant medication.ResultsSixteen observational studies were included, together reporting 7703 patients with CDI; among these, 1525 patients (19.8%) developed recurrent CDI. The rate of recurrent CDI in patients with gastric acid suppression was 22.1% (892 of 4038 patients) compared with 17.3% (633 of 3665) in patients without gastric acid suppression, which indicated an increased risk by meta-analysis (odds ratio [OR], 1.52; 95% CI, 1.20-1.94; P < .001). There was significant heterogeneity among the studies, with an I2 value of 64%. Subgroup analyses of studies adjusting for age and potential confounders confirmed an increased risk of recurrent CDI with use of gastric acid suppressants (OR, 1.38; 95% CI, 1.08-1.76; P = .02).Conclusions and RelevanceMeta-analyses of observational studies suggest that patients who receive gastric acid suppressants may be at increased risk for recurrent CDI. These data should be interpreted with caution because they may be confounded owing to the observational design of the individual studies. It may be reasonable to re-evaluate the need for these medications in patients with CDI.

4. Reducing Clostridium difficile in the Inpatient Setting: A Systematic Review of the Adherence to and Effectiveness of C. difficile Prevention Bundles.

Author(s): Barker, Anna K; Ngam, Caitlyn; Musuuza, Jackson S; Vaughn, Valerie M; Safdar, Nasia

Source: Infection control and hospital epidemiology; Jun 2017; vol. 38 (no. 6); p. 639-650

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28343455

Abstract:BACKGROUND Clostridium difficile infection (CDI) is the most common infectious cause of nosocomial diarrhea, and its prevention is an urgent public health priority. However, reduction of CDI is challenging because of its complex pathogenesis, large reservoirs of colonized patients, and the persistence of infectious spores. The literature lacks high-quality evidence for evaluating interventions, and many hospitals have implemented bundled interventions to reduce CDI with variable results. Thus, we conducted a systematic review to examine the components of CDI bundles, their implementation processes, and their impact on CDI rates. METHODS We conducted a comprehensive literature search of multiple computerized databases from their date of inception through April 30, 2016. The protocol was registered in PROSPERO, an international prospective register of systematic reviews. Bundle effectiveness, adherence, and study quality were assessed for each study meeting our criteria for inclusion. RESULTS In the 26 studies that met the inclusion criteria for this review, implementation and adherence factors to interventions were variably and incompletely reported, making study reproducibility and replicability challenging. Despite contextual differences and the variety of bundle components utilized, all 26 studies reported an improvement in CDI rates. However, given the lack of randomized controlled trials in the literature, assessing a causal relationship between bundled interventions and CDI rates is currently impossible. CONCLUSION Cluster randomized trials that include a rigorous assessment of the implementation of bundled interventions are urgently needed to causally test the effect of intervention bundles on CDI rates.

5. Timely Use of Probiotics in Hospitalized Adults Prevents Clostridium difficile Infection: A Systematic Review With Meta-Regression Analysis.

Author(s): Shen, Nicole T; Maw, Anna; Tmanova, Lyubov L; Pino, Alejandro; Ancy, Kayley; Crawford, Carl V; Simon, Matthew S; Evans, Arthur T

Source: Gastroenterology; Jun 2017; vol. 152 (no. 8); p. 1889

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28192108

Abstract:BACKGROUND & AIMSSystematic reviews have provided evidence for the efficacy of probiotics in preventing Clostridium difficile infection (CDI), but guidelines do not recommend probiotic use for prevention of CDI. We performed an updated systematic review to help guide clinical practice.METHODSWe searched MEDLINE, EMBASE, International Journal of Probiotics and Prebiotics, and The Cochrane Library databases for randomized controlled trials evaluating use of probiotics and CDI in hospitalized adults taking antibiotics. Two reviewers independently extracted data and assessed risk of bias and overall quality of the evidence. Primary and secondary outcomes were incidence of CDI and adverse events, respectively. Secondary analyses examined the effects of probiotic species, dose, timing, formulation, duration, and study quality.RESULTSWe analyzed data from 19 published studies, comprising 6261 subjects. The incidence of CDI in the probiotic cohort, 1.6% (54 of 3277), was lower than of controls, 3.9% (115 of 2984) (P 50% in hospitalized adults. Future research should focus on optimal probiotic dose, species, and formulation. Systematic Review Registration: PROSPERO CRD42015016395.

6. Clostridium Difficile Infection in Acute Care Hospitals: Systematic Review and Best Practices for Prevention.

Author(s): Louh, Irene K; Greendyke, William G; Hermann, Emilia A; Davidson, Karina W; Falzon, Louise; Vawdrey, David K; Shaffer, Jonathan A; Calfee, David P; Furuya, E Yoko; Ting, Henry H

Source: Infection control and hospital epidemiology; Apr 2017; vol. 38 (no. 4); p. 476-482

Publication Date: Apr 2017

Publication Type(s): Journal Article

PubMedID: 28300019

Abstract:OBJECTIVE Prevention of Clostridium difficile infection (CDI) in acute-care hospitals is a priority for hospitals and clinicians. We performed a qualitative systematic review to update the evidence on interventions to prevent CDI published since 2009. DESIGN We searched Ovid, MEDLINE, EMBASE, The Cochrane Library, CINAHL, the ISI Web of Knowledge, and grey literature databases from January 1, 2009 to August 1, 2015. SETTING We included studies performed in acute-care hospitals. PATIENTS OR PARTICIPANTS We included studies conducted on hospitalized patients that investigated the impact of specific interventions on CDI rates. INTERVENTIONS We used the QI-Minimum Quality Criteria Set (QI-MQCS) to assess the quality of included studies. Interventions were grouped thematically: environmental disinfection, antimicrobial stewardship, hand hygiene, chlorhexidine bathing, probiotics, bundled approaches, and others. A meta-analysis was performed when possible. RESULTS Of 3,236 articles screened, 261 met the criteria for full-text review and 46 studies were ultimately included. The average quality rating was 82% according to the QI-MQCS. The most effective interventions, resulting in a 45% to 85% reduction in CDI, included daily to twice daily disinfection of high-touch surfaces (including bed rails) and terminal cleaning of patient rooms with chlorine-based products. Bundled interventions and antimicrobial stewardship showed promise for reducing CDI rates. Chlorhexidine bathing and intensified hand-hygiene practices were not effective for reducing CDI rates. CONCLUSIONS Daily and terminal cleaning of patient rooms using chlorine-based products were most effective in reducing CDI rates in hospitals. Further studies are needed to identify the components of bundled interventions that reduce CDI rates.

Bronchiolitis

1. Early Halt of a Randomized Controlled Study with 3% Hypertonic Saline in Acute Bronchiolitis.

Author(s): Carsin, Ania; Sauvaget, Emilie; Bresson, Violaine; Retornaz, Karine; Cabrera, Maria; Jouve, Elisabeth; Truillet, Romain; Bosdure, Emmanuelle; Dubus, Jean-Christophe

Source: Respiration; international review of thoracic diseases; Jun 2017

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28647745

Abstract:BACKGROUNDAlbeit not recommended because of contradictory results, nebulized 3% hypertonic saline is widely used for treating acute viral bronchiolitis. Whether clinical differences may be attributed to the type of nebulizer used has never been studied.OBJECTIVESBy modifying the amount of salt deposited into the airways, the nebulizer characteristics might influence clinical response.METHODSA prospective, randomized, controlled trial included infants hospitalized in a French university hospital for a first episode of bronchiolitis. Each child received 6 nebulizations of 3% hypertonic saline during 48 h delivered with 1 of the 3 following nebulizers: 2 jet nebulizers delivering large or small particles, with a low aerosol output, and 1 mesh nebulizer delivering small particles, with a high aerosol output. The primary endpoint was the difference in the Wang score at 48 h.RESULTSOnly 61 children of 168 were recruited before stopping this study because of severe adverse events (n = 4) or parental requests for discontinuation due to discomfort to their child during nebulization (n = 2). One minor adverse event was noted in 91.8% (n = 56/61) of children. A high aerosol output induced 75% of the severe adverse events; it was significantly associated with the nebulization-induced cough between 24 and 48 h (p = 0.036). Decreases in Wang scores were not significantly different between the groups at 48 h, 9 recoveries out of 10 being obtained with

small particles.CONCLUSIONNo beneficial effects and possibly severe adverse events are observed with 3% hypertonic saline in the treatment of bronchiolitis.

2. Non-invasive ventilation improves respiratory distress in children with acute viral bronchiolitis: a systematic review.

Author(s): Combret, Yann; Prieur, Guillaume; LE Roux, Pascal; Médrinal, Clément

Source: Minerva anestesiologica; Jun 2017; vol. 83 (no. 6); p. 624-637

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28192893

Abstract:INTRODUCTIONNon-invasive ventilation (NIV) is a common treatment for bronchiolitis. However, consensus concerning its efficacy is lacking. The aim of this systematic review was to assess NIV effectiveness to reduce respiratory distress. Secondary objectives were to summarize the effects of NIV, identify predictive factors for failure and describe settings and applications.EVIDENCE ACQUISITIONLiterature searches were conducted in MEDLINE/PubMed, PEDro, Cochrane, EMBASE, CINAHL, Web of Science, UpToDate, and SuDoc from 1990 to April 2015. Randomized controlled trials, controlled non-randomized trials and prospective studies of NIV (continuous positive airway pressure [CPAP], bi-level CPAP, or neurally-adjusted ventilator assist) for bronchiolitis in infants younger than 2 years were included.EVIDENCE SYNTHESISFourteen studies were included, for a total of 379 children. Of these, 357 were treated with NIV as first intention. Respiratory distress, heart rate, respiratory rate and respiratory effort improved ($P<0.05$). Results were inconclusive regarding prevention of endotracheal intubation. Few adverse events were reported. NIV reduced carbon dioxide pressure (pCO_2) in 10 studies. Two randomized controlled studies reported a decrease of 7 mmHg in pCO_2 ($P<0.05$). Predictive factors of NIV failure were apneas, high pCO_2, young age, low weight, elevated heart rate and high pediatric risk of mortality score. NIV is mostly administered through a nasal mask, nasal cannula or helmet, with an initial expiratory positive airway pressure of 7 cmH_2O.CONCLUSIONSNIV shows promising results for the reduction of respiratory distress in acute viral bronchiolitis, as shown in several recent studies. However, there is a lack of robust studies to confirm this.

3. A comparison of two clinical scores for bronchiolitis. A multicentre and prospective study conducted in hospitalised infants.

Author(s): Rivas-Juesas, C; Rius Peris, J M; García, A L; Madramany, A A; Peris, M G; Álvarez, L V; Primo, J

Source: Allergologia et immunopathologia; Jun 2017

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28629673

Abstract:BACKGROUNDThere are a number of clinical scores for bronchiolitis but none of them are firmly recommended in the guidelines.METHODWe designed a study to compare two scales of bronchiolitis (ESBA and Wood Downes Ferres) and determine which of them better predicts the severity. A multicentre prospective study with patients <12 months with acute bronchiolitis was conducted. Each patient was assessed with the two scales when admission was decided. We created a new variable "severe condition" to determine whether one scale afforded better discrimination of severity. A diagnostic test analysis of sensitivity and specificity was made, with a comparison of the AUC. Based on the optimum cut-off points of the ROC curves for classifying bronchiolitis as severe

we calculated new Se, Sp, LR+ and LR- for each scale in our sample.RESULTS201 patients were included, 66.7% males and median age 2.3 months (IQR=1.3-4.4). Thirteen patients suffered bronchiolitis considered to be severe, according to the variable severe condition. ESBA showed a Se=3.6%, Sp=98.1%, and WDF showed Se=46.2% and Sp=91.5%. The difference between the two AUC for each scale was 0.02 (95%CI: 0.01-0.15), p=0.72. With new cut-off points we could increase Se and Sp for ESBA: Se=84.6%, Sp=78.7%, and WDF showed Se=92.3% and Sp=54.8%; with higher LR.CONCLUSIONSNone of the scales studied was considered optimum for assessing our patients. With new cut-off points, the scales increased the ability to classify severe infants. New validation studies are needed to prove these new cut-off points.

4. Variability of Care in Infants with Severe Bronchiolitis: Less-Invasive Respiratory Management Leads to Similar Outcomes.

Author(s): Essouri, Sandrine; Baudin, Florent; Chevret, Laurent; Vincent, Mélanie; Emeriaud, Guillaume; Jouvet, Philippe

Source: The Journal of pediatrics; Jun 2017

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28602381

Abstract:OBJECTIVETo compare the management of children with severe bronchiolitis requiring intensive care (based on duration of ventilatory support and duration of pediatric intensive care unit [PICU] stay) in 2 countries with differing pediatric transport and PICU organizations.STUDY DESIGNThis was a prospective observational care study in 2 PICUs of tertiary care university hospitals, 1 in France and 1 in Canada. All children with bronchiolitis who required admission to the PICU between November 1, 2013, and March 31, 2014, were included.RESULTSA total of 194 children were included. Baseline characteristics and illness severity were similar at the 2 sites. There was a significant difference between centers in the use of invasive ventilation (3% in France vs 26% in Canada; P < .0001). The number of investigations performed from admission to emergency department presentation and during the PICU stay was significantly higher in Canada for both chest radiographs and blood tests (P < .001). The use of antibiotics was significantly higher in Canada both before (60% vs 28%; P < .001) and during (72% vs 33%; P < .0001) the PICU stay. The duration of ventilatory support, median length of stay, and rate of PICU readmission were similar in the 2 centers.CONCLUSIONImportant differences in the management of children with severe bronchiolitis were observed during both prehospital transport and PICU treatment. Less invasive management resulted in similar outcomes with in fewer complications.

5. Effect of Nebulized Hypertonic Saline Treatment in Emergency Departments on the Hospitalization Rate for Acute Bronchiolitis: A Randomized Clinical Trial.

Author(s): Angoulvant, François; Bellêttre, Xavier; Milcent, Karen;et al; Efficacy of 3% Hypertonic Saline in Acute Viral Bronchiolitis (GUERANDE) Study Group

Source: JAMA pediatrics; Jun 2017 ; p. e171333

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28586918

Abstract: ImportanceAcute bronchiolitis is the leading cause of hospitalization among infants. Previous studies, underpowered to examine hospital admission, have found a limited benefit of nebulized hypertonic saline (HS) treatment in the pediatric emergency department (ED).ObjectiveTo

examine whether HS nebulization treatment would decrease the hospital admission rate among infants with a first episode of acute bronchiolitis.Design, Setting, and ParticipantsThe Efficacy of 3% Hypertonic Saline in Acute Viral Bronchiolitis (GUERANDE) study was a multicenter, double-blind randomized clinical trial on 2 parallel groups conducted during 2 bronchiolitis seasons (October through March) from October 15, 2012, through April 15, 2014, at 24 French pediatric EDs. Among the 2445 infants (6 weeks to 12 months of age) assessed for inclusion, 777 with a first episode of acute bronchiolitis with respiratory distress and no chronic medical condition were included.InterventionsTwo 20-minute nebulization treatments of 4 mL of HS, 3%, or 4 mL of normal saline (NS), 0.9%, given 20 minutes apart.Main Outcomes and MeasuresHospital admission rate in the 24 hours after enrollment.ResultsOf the 777 infants included in the study (median age, 3 months; interquartile range, 2-5 months; 468 [60.2%] male), 385 (49.5%) were randomized to the HS group and 387 (49.8%) to the NS group (5 patients did not receive treatment). By 24 hours, 185 of 385 infants (48.1%) in the HS group were admitted compared with 202 of 387 infants (52.2%) in the NS group. The risk difference for hospitalizations was not significant according to the mixed-effects regression model (adjusted risk difference, -3.2%; 95% CI, -8.7% to 2.2%; P = .25). The mean (SD) Respiratory Distress Assessment Instrument score improvement was greater in the HS group (-3.1 [3.2]) than in the NS group (-2.4 [3.3]) (adjusted difference, -0.7; 95% CI, -1.2 to -0.2; P = .006) and similarly for the Respiratory Assessment Change Score. Mild adverse events, such as worsening of cough, occurred more frequently among children in the HS group (35 of 392 [8.9%]) than among those in the NS group (15 of 384 [3.9%]) (risk difference, 5.0%; 95% CI, 1.6%-8.4%; P = .005), with no serious adverse events.Conclusions and RelevanceNebulized HS treatment did not significantly reduce the rate of hospital admissions among infants with a first episode of acute moderate to severe bronchiolitis who were admitted to the pediatric ED relative to NS, but mild adverse events were more frequent in the HS group.Trial Registrationclinicaltrials.gov Identifier: NCT01777347.

6. Efficacy and safety of Laggera pterodonta in children 3-24 months with acute bronchiolitis: a randomized controlled trial.

Author(s): Shang, Xiaoli; Liabsuetrakul, Tippawan; Sangsupawanich, Pasuree; Xia, Xiaoling; He, Ping; Cao, Hong; McNeil, Edward

Source: The clinical respiratory journal; May 2017; vol. 11 (no. 3); p. 296-304

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 26076757

Abstract:INTRODUCTIONLaggera pterodonta, a traditional Chinese medicine, has been commonly used in respiratory tract infections for more than hundreds of years without any randomized controlled trials to evaluate its efficacy and safety.OBJECTIVESTo evaluate the efficacy and safety of Laggera pterodonta in hospitalized children aged 3-24 months with acute bronchiolitis.METHODSA double-blind, randomized-controlled trial was conducted in three tertiary hospitals of Kunming, China. A total of 133 acute bronchiolitis children with an initial episode of wheezing were randomly assigned to a control mixture or Laggera pterodonta mixture. All recruited patients were given three doses of the mixture every 24 h for 5 days. Clinical symptoms and responses including adverse events in both groups were assessed and laboratory tests were done at enrolment and then after 120 h. Analysis was performed based on an intention-to-treat principle.RESULTSSignificantly more hospitalized children fulfilled the discharge criteria at 96 h and 120 h in the Laggera pterodonta mixture group compared to the control group (97% vs 75.8% P < 0.001 and 98.5% vs 89.4% P = 0.03), respectively. Better responses on clinical severity score, respiratory rate, oxygen saturation, wheezing and heart rate were also detected in the Laggera pterodonta mixture group along with lower white blood cell count, platelet count and aspartate aminotransferase. Vomiting and diarrhea

were more common in the control group.CONCLUSIONLaggera pterodonta mixture is effective and safe to be prescribed in hospitalized children with acute bronchiolitis.

7. The impact of temperature and relative humidity on spatiotemporal patterns of infant bronchiolitis epidemics in the contiguous United States.

Author(s): Sloan, Chantel; Heaton, Matthew; Kang, Sorah; Berrett, Candace; Wu, Pingsheng; Gebretsadik, Tebeb; Sicignano, Nicholas; Evans, Amber; Lee, Rees; Hartert, Tina

Source: Health & place; May 2017; vol. 45 ; p. 46-54

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 28285184

Abstract: Infant bronchiolitis is primarily due to infection by respiratory syncytial virus (RSV), which is highly seasonal. The goal of the study is to understand how circulation of RSV is impacted by fluctuations in temperature and humidity in order to inform prevention efforts. Using data from the Military Health System (MHS) Data Repository (MDR), we calculated rates of infant bronchiolitis for the contiguous US from July 2004 to June 2013. Monthly temperature and relative humidity were extracted from the National Climate Data Center. Using a spatiotemporal generalized linear model for binomial data, we estimated bronchiolitis rates and the effects of temperature and relative humidity while allowing them to vary over location and time. Our results indicate a seasonal pattern that begins in the Southeast during November or December, then spreading in a Northwest direction. The relationships of temperature and humidity were spatially heterogeneous, and we find that climate can partially account for early onset or longer epidemic duration. Small changes in climate may be associated with larger fluctuations in epidemic duration.

8. Humidified high-flow nasal cannula oxygen in bronchiolitis reduces need for invasive ventilation but not intensive care admission.

Author(s): Goh, Chong Tien; Kirby, Lynette J; Schell, David N; Egan, Jonathan R

Source: Journal of paediatrics and child health; May 2017

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 28544665

Abstract:AIMTo describe the changes to paediatric intensive care unit (PICU) admission patterns and ventilation requirements for children with bronchiolitis following the introduction of humidified high-flow nasal cannula oxygen outside the PICU.METHODSRetrospective study comparing patients <24 months of age with a discharge diagnosis of bronchiolitis admitted to the PICU. A comparison was made between those before humidified high-flow nasal cannula oxygen use (year 2008) to those immediately following the introduction of humidified high-flow nasal cannula oxygen use (year 2011) and those following further consolidation of humidified high-flow nasal cannula oxygen use outside the PICU (year 2013).RESULTSHumidified high-flow nasal cannula oxygen use up to 1 L/kg/min in the hospital did not reduce PICU admission. Intubation rates were reduced from 22.2% in 2008 to 7.8% in 2013. There was a non-significant trend towards decreased length of stay in the PICU while hospital length of stay showed a significant decrease following the introduction of humidified high-flow nasal cannula oxygen. Age <6 months and respiratory syncytial virus bronchiolitis were associated with an increased chance of failing humidified high-flow nasal cannula oxygen therapy.CONCLUSIONHumidified high-flow nasal cannula oxygen utilised outside of the PICU in our institution for children with bronchiolitis did not reduce admission rates or length of stay to

the PICU but was associated with a decreasing need for invasive ventilation and reduced hospital length of stay.

9. Associations of Nasopharyngeal Metabolome and Microbiome with Severity Among Infants with Bronchiolitis: A Multi-omic Analysis.

Author(s): Stewart, Christopher J; Mansbach, Jonathan M; Wong, Matthew C; Ajami, Nadim J; Petrosino, Joseph F; Camargo, Carlos A; Hasegawa, Kohei

Source: American journal of respiratory and critical care medicine; May 2017

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 28530140

Available in full text at American Journal of Respiratory and Critical Care Medicine - from ProQuest

Available in full text at American journal of respiratory and critical care medicine [Am J Respir Crit Care Med] NLMUID: 9421642 - from EBSCOhost

Abstract:RATIONALEBronchiolitis is the most common lower respiratory infection in infants; however, it remains unclear which infants with bronchiolitis will develop severe illness. In addition, while emerging evidence indicates associations of the upper-airway microbiome with bronchiolitis severity, little is known about the mechanisms linking airway microbes and host response to disease severity.OBJECTIVESTo determine the relations among the nasopharyngeal airway metabolome profiles, microbiome profiles, and severity in infants with bronchiolitis.METHODSWe conducted a multicenter prospective cohort study of infants (age <1 year) hospitalized with bronchiolitis. By applying metabolomic and metagenomic (16S rRNA gene and whole genome shotgun sequencing) approaches to 144 nasopharyngeal airway samples collected within 24 hours of hospitalization, we determined metabolome and microbiome profiles and their association with higher severity, defined by the use of positive pressure ventilation (PPV) - i.e., continuous positive airway pressure and/or intubation.MEASUREMENTS AND MAIN RESULTSNasopharyngeal airway metabolome profiles significantly differed by bronchiolitis severity (P<0.001). Among 254 metabolites identified, a panel of 25 metabolites showed high sensitivity (84%) and specificity (86%) in predicting the use of PPV. The intensity of these metabolites was correlated with relative abundance of Streptococcus pneumoniae. In the pathway analysis, sphingolipid metabolism was the most significantly enriched sub-pathway in infants with PPV use compared to those without (P<0.001). Enrichment of sphingolipid metabolites was positively correlated with the relative abundance of S. pneumoniae.CONCLUSIONSOur multi-omic analyses demonstrate not only the ability of the metabolomics approach to determine bronchiolitis severity, but also the interrelation between the microbiome and host in bronchiolitis pathobiology.

10. Real-life comparison of three general paediatric wards showed similar outcomes for children with bronchiolitis despite different treatment regimens.

Author(s): Shmueli, Einat; Berger, Tal; Herman, Yonatan A; Chodick, Gabriel; Rom, Eran; Bilavsky, Efraim; Ashkenazi-Hoffnung, Liat; Ashkenazi, Shai; Amir, Jacob; Prais, Dario

Source: Acta paediatrica (Oslo, Norway : 1992); May 2017

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 28510350

Abstract:AIMThis study evaluated the effectiveness of three different treatments for bronchiolitis in a tertiary paediatric facility.METHODSPatients with bronchiolitis who were younger than two years of age and were randomly allocated to three general wards at Schneider Children's Medical Center, Israel, after admission were included. Different treatment protocols in the wards were retrospectively compared.RESULTSThe study comprised 286 children. The clinical and laboratory parameters on admission were similar between the wards. In Ward C where nebulised hypertonic saline was infrequently administered (6.7%), the mean number of days with oxygen saturation under 92% and the meanlength of hospital stay (1.8 and 3.8 days) were significantly lower than Ward A (2.8 and 5.3 days) and Ward B, (2.9 and 4.7 days) where nebulised hypertonic saline was given more frequently (38.7%-74.7%). Multivariate analysis indicated that low saturation on admission, leukocytosis and use of nebulised hypertonic saline or adrenalin were independent predictors of a longer period of desaturation and hospital stay.CONCLUSIONDifferent treatment protocols for bronchiolitis were used in three paediatric wards in this real-life study. No treatment regimen proved superior. Inhalations of hypertonic saline or adrenaline were associated with a longer hospital stay.

11. Respiratory-syncytial-virus- and rhinovirus-related bronchiolitis in children aged <2 years in an English district general hospital.

Author(s): Paul, S P; Mukherjee, A; McAllister, T; Harvey, M J; Clayton, B A; Turner, P C

Source: The Journal of hospital infection; May 2017

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 28559125

Abstract:BACKGROUNDBronchiolitis is the most common reason for hospitalization in young children. In addition to respiratory syncytial virus (RSV), other viruses have been increasingly implicated. Guidance on testing has also changed.AIMSTo compare clinicopathological outcomes in young children admitted with bronchiolitis due to RSV in comparison with rhinovirus (RV), and identify associated risk/epidemiological factors.METHODSChildren aged less than two years admitted to hospital with a clinical diagnosis of bronchiolitis with positive results for either RSV or RV were included in this study. Polymerase-chain-reaction-negative cases using an extended respiratory virus panel served as a control group. Retrospective data were collected on sex, risk factors, respiratory support, intravenous fluids and antibiotics. Outcomes such as length of stay (LOS) and need for transfer to the high-dependency unit/paediatric intensive care unit were included.FINDINGSTwo hundred and twenty-seven out of 437 nasopharyngeal aspirate samples were positive for either RSV (N = 162) or RV (N = 65). The median age of cases was three months and 75% had at least one risk factor. Risk factors were higher in the RV group (P = 0.004). RV accounted for the majority of cases outside the RSV season (P < 0.01). RV-associated bronchiolitis had a longer LOS (more than seven days) (P < 0.05) and increased need for chest X-rays and/or antibiotics (P < 0.05). Use of intravenous fluids and respiratory support were higher in the RV group, but the difference was not significant.CONCLUSIONSRV is the second most common pathogen associated with bronchiolitis and is isolated all year round. This may be important in those with risk factors resulting in prolonged LOS. Further research is necessary to establish the exact role of RV in this common condition, particularly outside the traditional RSV season.

RSV

1. Group B streptococcus and respiratory syncytial virus immunisation during pregnancy: a landscape analysis.

Author(s): Heath, Paul T; Culley, Fiona J; Jones, Christine E; Kampmann, Beate; Le Doare, Kirsty; Nunes, Marta C; Sadarangani, Manish; Chaudhry, Zain; Baker, Carol J; Openshaw, Peter J M

Source: The Lancet. Infectious diseases; Jul 2017; vol. 17 (no. 7); p. e223

Publication Date: Jul 2017

Publication Type(s): Journal Article Review

PubMedID: 28433702

Abstract: Group B streptococcus and respiratory syncytial virus are leading causes of infant morbidity and mortality worldwide. No licensed vaccines are available for either disease, but vaccines for both are under development. Severe respiratory syncytial virus disease can be prevented by passively administered antibody. The presence of maternal IgG antibody specific to respiratory syncytial virus is associated with reduced prevalence and severity of respiratory syncytial virus disease in the first few weeks of life, whereas maternal serotype-specific anticapsular antibody is associated with protection against both early-onset and late-onset group B streptococcus disease. Therefore, vaccination in pregnancy might protect infants against both diseases. This report describes what is known about immune protection against group B streptococcus and respiratory syncytial virus, identifies knowledge gaps regarding the immunobiology of both diseases, and aims to prioritise research directions in maternal immunisation.

2. Passive and active immunization against respiratory syncytial virus for the young and old.

Author(s): Villafana, Tonya; Falloon, Judith; Griffin, M Pamela; Zhu, Qing; Esser, Mark T

Source: Expert review of vaccines; Jul 2017; vol. 16 (no. 7); p. 1-13

Publication Date: Jul 2017

Publication Type(s): Journal Article

PubMedID: 28525961

Abstract:INTRODUCTIONRespiratory syncytial virus (RSV) is the leading cause of lower respiratory tract infections in infants worldwide and also causes significant disease in the elderly. Despite 60 years of RSV research and vaccine development, there is only one approved medicine to prevent RSV infections. Palivizumab, a monoclonal antibody (mAb) against the RSV fusion (F) protein, is indicated for preterm infants and children at high-risk for RSV infections. It is an active time in RSV vaccine and mAb development with 14 vaccines and 2 mAbs currently being tested in clinical trials as of 13 February 2017. Active vaccination of women in the third trimester or passive immunization of infants with a mAb are particularly attractive approaches as the most severe disease occurs within the first 6 months of life. Areas covered: Here, we review current approaches for preventing RSV in the young and old, describe proposed clinical endpoints for studies in pediatric and adult clinical trials and highlight results from recent and ongoing clinical studies. Expert commentary: With 16 candidates in clinical development, approval of the first RSV vaccine or mAb for the prevention of RSV in all infants or the elderly is likely to occur in the next five years.

3. Defining the Incidence and Associated Morbidity and Mortality of Severe Respiratory Syncytial Virus Infection Among Children with Chronic Diseases.

Author(s): Manzoni, Paolo; Figueras-Aloy, Josep; Simões, Eric A F; Checchia, Paul A; Fauroux, Brigitte; Bont, Louis; Paes, Bosco; Carbonell-Estrany, Xavier

Source: Infectious diseases and therapy; Jun 2017

Publication Date: Jun 2017

Publication Type(s): Journal Article Review

PubMedID: 28653300

Abstract:INTRODUCTIONREGAL (RSV Evidence-a Geographical Archive of the Literature) has provided a comprehensive review of the published evidence in the field of respiratory syncytial virus (RSV) in Western countries over the last 20 years. This review covers the risk and burden of RSV infection in children with underlying medical conditions or chronic diseases (excluding prematurity and congenital heart disease).METHODSA systematic review of publications between January 1, 1995 and December 31, 2015 across PubMed, Embase, The Cochrane Library, and Clinicaltrials.gov was supplemented by papers identified by the authors through March 2017. Studies reporting data for hospital visits/admissions for RSV infection as well as studies reporting RSV-associated morbidity and mortality were included. Study quality and strength of evidence (SOE) were graded.RESULTSA total of 2703 studies were identified and 58 were included. Down syndrome, irrespective of prematurity and congenital heart disease (moderate SOE), immunocompromised children (low SOE), cystic fibrosis (low SOE), and neurologic conditions (low SOE) were associated with a significantly increased risk of RSV hospitalization. A number of other congenital malformations and chronic conditions were also associated with severe RSV disease (low SOE). In general, pre-existing disease was also a predisposing factor for RSV-related mortality (low SOE).CONCLUSIONSevere RSV infection in infants and young children with underlying medical conditions or chronic diseases poses a significant health burden. Further studies are needed to fully quantify the epidemiology, burden and outcomes in these populations, in particular RSV-attributable mortality.

4. The Burden and Long-term Respiratory Morbidity Associated with Respiratory Syncytial Virus Infection in Early Childhood.

Author(s): Fauroux, Brigitte; Simões, Eric A F; Checchia, Paul A; Paes, Bosco; Figueras-Aloy, Josep; Manzoni, Paolo; Bont, Louis; Carbonell-Estrany, Xavier

Source: Infectious diseases and therapy; Jun 2017; vol. 6 (no. 2); p. 173-197

Publication Date: Jun 2017

Publication Type(s): Journal Article Review

PubMedID: 28357706

Abstract:INTRODUCTIONThe REGAL (RSV Evidence-a Geographical Archive of the Literature) series provide a comprehensive review of the published evidence in the field of respiratory syncytial virus (RSV) in Western countries over the last 20 years. The objective of this fifth publication was to determine the long-term respiratory morbidity associated with RSV lower respiratory tract infection (RSV LRTI) in early life.METHODSA systematic review was undertaken for articles published between January 1, 1995 and December 31, 2015. This was supplemented by inclusion of papers published whilst drafting the manuscript. Studies reporting data on the incidence and long-term wheezing and asthma following RSV LRTI in early life were included. Study quality and strength of evidence (SOE) were graded using recognized criteria.RESULTSA total of 2337 studies were identified of which 74 were included. Prospective, epidemiologic studies consistently demonstrated that RSV LRTI is a significant risk factor for on-going respiratory morbidity characterized by transient early wheezing and recurrent wheezing and asthma within the first decade of life and possibly into adolescence and adulthood (high SOE). RSV LRTI was also associated with impaired lung function in these children (high SOE). Respiratory morbidity has been shown to result in reduced quality of life and increased

healthcare resource use (moderate SOE). The mechanisms through which RSV contributes to wheezing/asthma development are not fully understood, but appear to relate to the viral injury, preexisting abnormal lung function and/or other factors that predispose to wheezing/asthma, including genetic susceptibility, altered immunology, eosinophilia, and associated risk factors such as exposure to environmental tobacco smoke (high SOE).CONCLUSIONThere is growing evidence that RSV LRTI in early childhood is associated with long-term wheezing and asthma and impaired lung function. Future research should aim to fully elucidate the pathophysiological mechanisms through which RSV causes recurrent wheezing/asthma.

5. Association of C-Reactive Protein With Bacterial and Respiratory Syncytial Virus-Associated Pneumonia Among Children Aged <5 Years in the PERCH Study.

Author(s): Higdon, Melissa M; Le, Tham; O'Brien, Katherine L; et al; PERCH Study Group

Source: Clinical infectious diseases : an official publication of the Infectious Diseases Society of America; Jun 2017; vol. 64 ; p. S378

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28575375

Abstract: Background.Lack of a gold standard for identifying bacterial and viral etiologies of pneumonia has limited evaluation of C-reactive protein (CRP) for identifying bacterial pneumonia. We evaluated the sensitivity and specificity of CRP for identifying bacterial vs respiratory syncytial virus (RSV) pneumonia in the Pneumonia Etiology Research for Child Health (PERCH) multicenter case-control study.Methods.We measured serum CRP levels in cases with World Health Organization-defined severe or very severe pneumonia and a subset of community controls. We evaluated the sensitivity and specificity of elevated CRP for "confirmed" bacterial pneumonia (positive blood culture or positive lung aspirate or pleural fluid culture or polymerase chain reaction [PCR]) compared to "RSV pneumonia" (nasopharyngeal/oropharyngeal or induced sputum PCR-positive without confirmed/suspected bacterial pneumonia). Receiver operating characteristic (ROC) curves were constructed to assess the performance of elevated CRP in distinguishing these cases.Results.Among 601 human immunodeficiency virus (HIV)-negative tested controls, 3% had CRP ≥40 mg/L. Among 119 HIV-negative cases with confirmed bacterial pneumonia, 77% had CRP ≥40 mg/L compared with 17% of 556 RSV pneumonia cases. The ROC analysis produced an area under the curve of 0.87, indicating very good discrimination; a cut-point of 37.1 mg/L best discriminated confirmed bacterial pneumonia (sensitivity 77%) from RSV pneumonia (specificity 82%). CRP ≥100 mg/L substantially improved specificity over CRP ≥40 mg/L, though at a loss to sensitivity.Conclusions.Elevated CRP was positively associated with confirmed bacterial pneumonia and negatively associated with RSV pneumonia in PERCH. CRP may be useful for distinguishing bacterial from RSV-associated pneumonia, although its role in discriminating against other respiratory viral-associated pneumonia needs further study.

6. Respiratory syncytial virus: prospects for new and emerging therapeutics.

Author(s): Jorquera, Patricia A; Tripp, Ralph A

Source: Expert review of respiratory medicine; Jun 2017 ; p. 1-7

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28574729

Abstract:INTRODUCTIONRespiratory syncytial virus (RSV) is the major cause of lower respiratory tract infections (LRTI) in infants, the elderly, and the immunocompromised. Although the development of a RSV vaccine has been a priority for >50 years, there is still no vaccine available. Treatment of RSV LRTI has remained mostly supportive, i.e. hydration and oxygenation. Palivizumab and ribavirin are the only options currently available for prevention and treatment of RSV infection, but evidence suggests that they are not fully effective. This creates a significant unmet medical need for new therapeutics for prevention and treatment of RSV worldwide. Areas covered: This article reviews the antiviral drugs and monoclonal antibodies (mAb) for RSV that are in different stages of clinical development. Expert commentary: Over the last 10 years, new antiviral drugs and mAb have shown clinical promise against RSV, and may become available in the coming years. Although the RSV fusion protein has been the most popular target for inhibitors and mAbs, new approaches targeting other viral proteins have shown promising results. To overcome the emergence of RSV escape mutants, combination antiviral therapy may be explored in the future.

7. Product review on the monoclonal antibody palivizumab for prevention of respiratory syncytial virus infection.

Author(s): Resch, Bernhard

Source: Human vaccines & immunotherapeutics; Jun 2017 ; p. 0

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28605249

Abstract: Respiratory syncytial virus (RSV) accounts for about 20% of all respiratory infections in children below the age of 5 years. It is associated with up to 63% of all acute respiratory infections and up to 81% of all viral lower respiratory tract infections causing hospitalization in infants and young children. RSV leads to seasonal epidemics between November and April in the northern hemisphere. Most severe infections (RSV accounts for 50 to 80% of all cause bronchiolitis) affect infants younger than 6 months of age and high-risk infants including those born preterm with or without bronchopulmonary dysplasia and those with hemodynamically significant congenital heart disease up to an age of 24 months. Palivizumab, a highly potent RSV-neutralizing monoclonal antibody (Mab), has been licensed in 1998 for prophylactic use to prevent RSV associated hospitalizations in high-risk infants. This Mab is given by monthly intramuscular injection at a dose of 15 mg/kg over the RSV season (up to 5 times). Palivizumab proved to be safe and well-tolerated in this population. Concerns have been raised regarding cost-effectiveness of palivizumab and thus, palivizumab prophylaxis is mainly limited to selected high-risk infants for the first RSV season. Long-lasting Mabs will be the next future approach in the prophylaxis of RSV hospitalization until a vaccine is developed.

8. A safe and efficient BCG vectored vaccine to prevent the disease caused by the human Respiratory Syncytial Virus.

Author(s): Rey-Jurado, Emma; Soto, Jorge; Gálvez, Nicolás; Kalergis, Alexis M

Source: Human vaccines & immunotherapeutics; Jun 2017 ; p. 0

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28598702

Abstract: The human Respiratory Syncytial Virus (hRSV) causes lower respiratory tract infections including pneumonia and bronchiolitis. Such infections also cause a large number of hospitalizations

and affects mainly newborns, young children and the elderly worldwide. Symptoms associated with hRSV infection are due to an exacerbated immune response characterized by low levels of IFN-γ, recruitment of neutrophils and eosinophils to the site of infection and lung damage. Although hRSV is a major health problem, no vaccines are currently available. Different immunization approaches have been developed to achieve a vaccine that activates the immune system, without triggering an unbalanced inflammation. These approaches include live attenuated vaccine, DNA or proteins technologies, and the use of vectors to express proteins of the virus. In this review, we discuss the host immune response to hRSV and the immunological mechanisms underlying an effective and safe BCG vectored vaccine against hRSV.

9. Respiratory Syncytial Virus Infection-associated Hospitalization Rates in Infants and Children With Cystic Fibrosis.

Author(s): Metz, Jakob; Eber, Ernst; Resch, Bernhard

Source: The Pediatric infectious disease journal; Jun 2017; vol. 36 (no. 6); p. 545-548

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28005688

Abstract:BACKGROUNDInfections with respiratory syncytial virus (RSV) are the leading cause for hospital admissions in infants and young children. The incidence of RSV-related hospitalizations in patients with cystic fibrosis (CF) is unclear. To date, no effective treatment for RSV infections is available. Thus, prophylaxis with the monoclonal antibody palivizumab is an important option.METHODSIn a retrospective, single-center study at the Department of Pediatrics and Adolescent Medicine of the Medical University Graz, Austria, we analyzed all CF patients born between 1995 and 2012, who were admitted for respiratory problems between 1995 and 2014. We also defined a group of hypothetical RSV infections with the following criteria: admission caused by a respiratory infection during the first RSV season of life when no test for RSV was performed. Furthermore, we assessed the effectiveness of palivizumab as a prevention of RSV-related hospitalizations.RESULTSA total of 51 patients with CF were identified. The RSV-related hospitalization rate for the first RSV season was 0. Two patients (3.9%) were hospitalized 3 and 4 times, respectively, caused by RSV infections. The mean age at the time of admission was 12.4 ± 2.5 years. One case (1.9%) met our criteria for hypothetical RSV infections. There was no difference in RSV-related hospitalization rates between patients who received palivizumab and those who did not.CONCLUSIONSWe found a low rate of RSV-related hospitalizations and could not demonstrate a benefit of palivizumab prophylaxis regarding a decrease of RSV-related hospital admissions. The role of RSV reinfections in CF patients beyond infancy appears to be underestimated.

10. Respiratory syncytial virus-Host interaction in the pathogenesis of bronchiolitis and its impact on respiratory morbidity in later life.

Author(s): Rossi, Giovanni A; Colin, Andrew A

Source: Pediatric allergy and immunology : official publication of the European Society of Pediatric Allergy and Immunology; Jun 2017; vol. 28 (no. 4); p. 320-331

Publication Date: Jun 2017

Publication Type(s): Journal Article Review

PubMedID: 28339145

Abstract: Respiratory syncytial virus (RSV) is the most common agent of severe airway disease in infants and young children. Large epidemiologic studies have demonstrated a clear relationship

between RSV infection and subsequent recurrent wheezing and asthma into childhood, thought to be predominantly related to long-term changes in neuroimmune control of airway tone rather than to allergic sensitization. These changes appear to be governed by the severity of the first RSV infection in infancy which in term depends on viral characteristics and load, but perhaps as importantly, on the genetic susceptibility and on the constitutional characteristic of the host. A variety of viral and host factors and their interplay modify the efficiency of the response to infection, including viral replication and the magnitude of structural and functional damage to the respiratory structures, and ultimately the extent, severity, and duration of subsequent wheezing.

11. Rapid tests for influenza, respiratory syncytial virus, and other respiratory viruses: a systematic review and meta-analysis.

Author(s): Bruning, Ahl; Leeflang, Mmg; Vos, Jmbw; Spijker, R; de Jong, M D; Wolthers, K C; Pajkrt, D

Source: Clinical infectious diseases : an official publication of the Infectious Diseases Society of America; May 2017

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 28520858

Abstract: Rapid diagnosis of respiratory virus infections contributes to patient care. This systematic review evaluates the diagnostic accuracy of rapid tests for the detection of respiratory viruses. We searched Medline and EMBASE for studies evaluating these tests against PCR as reference standard. 179 studies were included of which 134 evaluated rapid tests for influenza viruses, 32 for RSV, and 13 for other respiratory viruses. We used the bivariate random effects model for quantitative meta-analysis of the results. Most tests detected only influenza viruses or RSV. Summary sensitivity- and specificity-estimates of tests for influenza were 61.1% and 98.9%. For RSV, summary sensitivity was 75.3% and specificity 98.7%. Quality of studies was assessed using the QUADAS-checklist. Because of incomplete reporting, risk of bias was often unclear. Despite their intended use at the point-of-care, 26.3% were evaluated in a laboratory-setting. Although newly developed tests seem more sensitive, high-quality evaluations of these tests are lacking.

12. Broadly Reactive Anti-Respiratory Syncytial Virus G Antibodies from Exposed Individuals Effectively Inhibit Infection of Primary Airway Epithelial Cells.

Author(s): Cortjens, B; Yasuda, E; Yu, X; Wagner, K; Claassen, Y B; Bakker, A Q; van Woensel, J B M; Beaumont, T

Source: Journal of virology; May 2017; vol. 91 (no. 10)

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 28275185

Available in full text at Journal of Virology - from National Library of Medicine

Abstract: Respiratory syncytial virus (RSV) causes severe respiratory disease in young children. Antibodies specific for the RSV prefusion F protein have guided RSV vaccine research, and in human serum, these antibodies contribute to >90% of the neutralization response; however, detailed insight into the composition of the human B cell repertoire against RSV is still largely unknown. In order to study the B cell repertoire of three healthy donors for specificity against RSV, CD27+ memory B cells were isolated and immortalized using BCL6 and Bcl-xL. Of the circulating memory B cells, 0.35% recognized RSV-A2-infected cells, of which 59% were IgA-expressing cells and 41% were

IgG-expressing cells. When we generated monoclonal B cells selected for high binding to RSV-infected cells, 44.5% of IgG-expressing B cells and 56% of IgA-expressing B cells reacted to the F protein, while, unexpectedly, 41.5% of IgG-expressing B cells and 44% of IgA expressing B cells reacted to the G protein. Analysis of the G-specific antibodies revealed that 4 different domains on the G protein were recognized. These epitopes predicted cross-reactivity between RSV strain A (RSV-A) and RSV-B and matched the potency of antibodies to neutralize RSV in HEp-2 cells and in primary epithelial cell cultures. G-specific antibodies were also able to induce antibody-dependent cellular cytotoxicity and antibody-dependent cellular phagocytosis of RSV-A2-infected cells. However, these processes did not seem to depend on a specific epitope. In conclusion, healthy adults harbor a diverse repertoire of RSV glycoprotein-specific antibodies with a broad range of effector functions that likely play an important role in antiviral immunity.IMPORTANCE Human RSV remains the most common cause of severe lower respiratory tract disease in premature babies, young infants, the elderly, and immunocompromised patients and plays an important role in asthma exacerbations. In developing countries, RSV lower respiratory tract disease has a high mortality. Without an effective vaccine, only passive immunization with palivizumab is approved for prophylactic treatment. However, highly potent RSV-specific monoclonal antibodies could potentially serve as a therapeutic treatment and contribute to disease control and mortality reduction. In addition, these antibodies could guide further vaccine development. In this study, we isolated and characterized several novel antibodies directed at the RSV G protein. This information can add to our understanding and treatment of RSV disease.

13. Consecutive yearly outbreaks of respiratory syncytial virus in a haemato-oncology ward and efficacy of infection control measures.

Author(s): Inkster, T; Ferguson, K; Edwardson, A; Gunson, R; Soutar, R

Source: The Journal of hospital infection; May 2017

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 28554834

Abstract:BACKGROUNDRespiratory syncytial virus (RSV) causes significant respiratory tract infection in immunosuppressed patients.AIMTo describe two consecutive yearly outbreaks of RSV in our haemato-oncology ward.METHODSHaematology patients presenting with respiratory symptoms were screened by polymerase chain reaction for viral respiratory pathogens using a saline gargle.FINDINGSNone of our patients had undergone bone marrow transplant but all had underlying haematological malignancies. Eight patients were affected in the first outbreak (mortality rate: 37.5%) and 12 patients were affected in the second (mortality rate: 8.3%). Extensive infection control measures were implemented in both outbreaks and were successful in preventing further cross-transmission.CONCLUSIONThere was significant learning from both outbreaks and actions implemented with the aim of reducing the likelihood and impact of future outbreaks.

14. Respiratory-syncytial-virus- and rhinovirus-related bronchiolitis in children aged <2 years in an English district general hospital.

Author(s): Paul, S P; Mukherjee, A; McAllister, T; Harvey, M J; Clayton, B A; Turner, P C

Source: The Journal of hospital infection; May 2017

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 28559125

Abstract:BACKGROUNDBronchiolitis is the most common reason for hospitalization in young children. In addition to respiratory syncytial virus (RSV), other viruses have been increasingly implicated. Guidance on testing has also changed.AIMSTo compare clinicopathological outcomes in young children admitted with bronchiolitis due to RSV in comparison with rhinovirus (RV), and identify associated risk/epidemiological factors.METHODSChildren aged less than two years admitted to hospital with a clinical diagnosis of bronchiolitis with positive results for either RSV or RV were included in this study. Polymerase-chain-reaction-negative cases using an extended respiratory virus panel served as a control group. Retrospective data were collected on sex, risk factors, respiratory support, intravenous fluids and antibiotics. Outcomes such as length of stay (LOS) and need for transfer to the high-dependency unit/paediatric intensive care unit were included.FINDINGSTwo hundred and twenty-seven out of 437 nasopharyngeal aspirate samples were positive for either RSV (N = 162) or RV (N = 65). The median age of cases was three months and 75% had at least one risk factor. Risk factors were higher in the RV group (P = 0.004). RV accounted for the majority of cases outside the RSV season (P < 0.01). RV-associated bronchiolitis had a longer LOS (more than seven days) (P < 0.05) and increased need for chest X-rays and/or antibiotics (P < 0.05). Use of intravenous fluids and respiratory support were higher in the RV group, but the difference was not significant.CONCLUSIONSRV is the second most common pathogen associated with bronchiolitis and is isolated all year round. This may be important in those with risk factors resulting in prolonged LOS. Further research is necessary to establish the exact role of RV in this common condition, particularly outside the traditional RSV season.

15. Detection of airborne respiratory syncytial virus in a pediatric acute care clinic.

Author(s): Grayson, Stephanie A; Griffiths, Pamela S; Perez, Miriam K; Piedimonte, Giovanni

Source: Pediatric pulmonology; May 2017; vol. 52 (no. 5); p. 684-688

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 27740722

Abstract:OBJECTIVERespiratory syncytial virus (RSV) is the most common cause of respiratory illness in infants and young children, but this virus is also capable of re-infecting adults throughout life. Universal precautions to prevent its transmission consist of gown and glove use, but masks and goggles are not routinely required because it is believed that RSV is unlikely to be transmitted by the airborne route. Our hypothesis was that RSV is present in respirable-size particles aerosolized by patients seen in a pediatric acute care setting.STUDY DESIGNRSV-laden particles were captured using stationary 2-stage bioaerosol cyclone samplers. Aerosol particles were separated into three size fractions (<1, 1-4.1, and ≥4.1 μm) and were tested for the presence of RSV RNA by real-time PCR. Samplers were set 152 cm ("upper") and 102 cm ("lower") above the floor in each of two examination rooms.RESULTSOf the total, 554 samples collected over 48 days, only 13 (or 2.3%) were positive for RSV. More than 90% of the RSV-laden aerosol particles were in the ≥4.1 μm size range, which typically settle to the ground within minutes, whereas only one sample (or 8%) was positive for particles in the 1-4.1 μm respirable size range.CONCLUSIONSOur data indicate that airborne RSV-laden particles can be detected in pediatric outpatient clinics during the epidemic peak. However, RSV airborne transmission is highly inefficient. Thus, the logistical and financial implications of mandating the use of masks and goggles to prevent RSV spread seem unwarranted in this setting.

16. Interference Between Respiratory Syncytial Virus and Human Rhinovirus Infection in Infancy.

Author(s): Achten, Niek B; Wu, Pingsheng; Bont, Louis; et al

Source: The Journal of infectious diseases; Apr 2017; vol. 215 (no. 7); p. 1102-1106

Publication Date: Apr 2017

Publication Type(s): Journal Article

PubMedID: 28368456

Abstract: BackgroundRespiratory syncytial virus (RSV) and human rhinovirus (HRV) are the most common viruses associated with acute respiratory tract infections in infancy. Viral interference is important in understanding respiratory viral circulation and the impact of vaccines.MethodsTo study viral interference, we evaluated cases of RSV and HRV codetection by polymerase chain reaction in 2 prospective birth cohort studies (the Infant Susceptibility to Pulmonary Infections and Asthma Following RSV Exposure [INSPIRE] study and the Tennessee Children's Respiratory Initiative [TCRI]) and a double-blinded, randomized, controlled trial (MAKI), using adjusted multivariable regression analyses.ResultsAmong 3263 respiratory tract samples, 24.5% (798) and 37.3% (1216) were RSV and HRV positive, respectively. The odds of HRV infection were significantly lower in RSV-infected infants in all cohorts, with adjusted odds ratios of 0.30 (95% confidence interval [CI], .22-.40 in the INSPIRE study, 0.18 (95% CI, .11-.28) in the TCRI (adjusted for disease severity), and 0.34 (95% CI, .16-.72) in the MAKI trial. HRV infection was significantly more common among infants administered RSV immunoprophylaxis, compared with infants who did not receive immunoprophylaxis (OR, 1.65; 95% CI, 1.65-2.39).ConclusionsA negative association of RSV on HRV codetection was consistently observed across populations, seasons, disease severity, and geographical regions. Suppressing RSV infection by RSV immunoprophylaxis might increase the risk of having HRV infection.

17. Respiratory syncytial virus hospitalization and mortality: Systematic review and meta-analysis.

Author(s): Stein, Renato T; Bont, Louis J; Zar, Heather; Polack, Fernando P; Park, Caroline; Claxton, Ami; Borok, Gerald; Butylkova, Yekaterina; Wegzyn, Colleen

Source: Pediatric pulmonology; Apr 2017; vol. 52 (no. 4); p. 556-569

Publication Date: Apr 2017

Publication Type(s): Journal Article Review

PubMedID: 27740723

Abstract:BACKGROUNDRespiratory syncytial virus (RSV) is a major public health burden worldwide. We aimed to review the current literature on the incidence and mortality of severe RSV in children globally.METHODSSystematic literature review and meta-analysis of published data from 2000 onwards, reporting on burden of acute respiratory infection (ARI) due to RSV in children. Main outcomes were hospitalization for severe RSV-ARI and death.RESULTSFive thousand two hundred and seventy-four references were identified. Fifty-five studies were included from 32 countries. The global RSV-ARI hospitalization estimates, reported per 1,000 children per year (95% Credible Interval (CrI), were 4.37 (2.98, 6.42) among children <5 years, 19.19 (15.04, 24.48) among children <1 year, 20.01 (9.65, 41.31) among children <6 months and 63.85 (37.52, 109.70) among premature children <1 year. The RSV-ARI global case-fatality estimates, reported per 1,000 children, (95% CrI) were 6.21 (2.64, 13.73) among children <5 years, 6.60 (1.85, 16.93) for children <1 year, and 1.04 (0.17, 12.06) among preterm children <1 year.CONCLUSIONSA substantial proportion of RSV-associated morbidity occurs in the first year of life, especially in children born prematurely. These data affirm the importance of RSV disease in the causation of hospitalization and as a significant contributor to pediatric mortality and further demonstrate gestational age as a critical determinant of disease severity. An important limitation of case-fatality ratios is the absence of individual patient characteristics of non-surviving patients. Moreover, case-fatality ratios cannot be translated to population-based mortality.

Surgical site infection

1. Review of MRSA screening and antibiotics prophylaxis in orthopaedic trauma patients; The risk of surgical site infection with inadequate antibiotic prophylaxis in patients colonized with MRSA.

Author(s): Iqbal, H J; Ponniah, N; Long, S; Rath, N; Kent, M

Source: Injury; Jul 2017; vol. 48 (no. 7); p. 1382-1387

Publication Date: Jul 2017

Publication Type(s): Journal Article

PubMedID: 28473167

Abstract:AIMSThe primary aim of this study was to determine whether orthopaedic trauma patients receive appropriate antibiotic prophylaxis keeping in view the results of their MRSA screening. The secondary aim was to analyse the risk of developing MRSA surgical site infection with and without appropriate antibiotic prophylaxis in those colonized with MRSA.PATIENTS AND METHODSWe reviewed 400 consecutive orthopaedic trauma patient episodes. Preoperative MRSA screening results, operative procedures, prophylactic antibiotics and postoperative course were explored. In addition to these consecutive patients, the hospital MRSA database over the previous 5 years identified 27 MRSA colonized acute trauma patients requiring surgery.RESULTSOf the 400 consecutive patient episodes, 395(98.7%) had MRSA screening performed on admission. However, in 236 (59.0%) cases, the results were not available before the surgery. Seven patient episodes (1.8%) had positive MRSA colonization. Analysis of 27 MRSA colonized patients revealed that 20(74%) patients did not have the screening results available before the surgery. Only 5(18.5%) received Teicoplanin and 22(81.4%) received cefuroxime for antibiotic prophylaxis before their surgery. Of those receiving cefuroxime, five (22.73%) patients developed postoperative MRSA surgical site infection (SSI) but none of those (0%) receiving Teicoplanin had MRSA SSI. The absolute risk reduction for SSI with Teicoplanin as antibiotic prophylaxis was 22.73% (CI=5.22%-40.24%) and NNT (Number Needed to Treat) was 5 (CI=2.5-19.2) CONCLUSION: Lack of available screening results before the surgery may lead to inadequate antibiotic prophylaxis increasing the risk of MRSA surgical site infection. Glycopeptide (e.g.Teicoplanin) prophylaxis should be considered when there is history of MRSA colonization or MRSA screening results are not available before the surgery.

2. Systematic review of risk prediction scores for surgical site infection or periprosthetic joint infection following joint arthroplasty.

Author(s): Kunutsor, S K; Whitehouse, M R; Blom, A W; Beswick, A D

Source: Epidemiology and infection; Jul 2017; vol. 145 (no. 9); p. 1738-1749

Publication Date: Jul 2017

Publication Type(s): Journal Article Review

PubMedID: 28264756

Available in full text at Epidemiology and Infection - from ProQuest

Abstract: Accurate identification of individuals at high risk of surgical site infections (SSIs) or periprosthetic joint infections (PJIs) influences clinical decisions and development of preventive strategies. We aimed to determine progress in the development and validation of risk prediction models for SSI or PJI using a systematic review. We searched for studies that have developed or validated a risk prediction tool for SSI or PJI following joint replacement in MEDLINE, EMBASE, Web of Science and Cochrane databases; trial registers and reference lists of studies up to September 2016. Nine studies describing 16 risk scores for SSI or PJI were identified. The number of component

variables in a risk score ranged from 4 to 45. The C-index ranged from 0·56 to 0·74, with only three risk scores reporting a discriminative ability of >0·70. Five risk scores were validated internally. The National Healthcare Safety Network SSIs risk models for hip and knee arthroplasties (HPRO and KPRO) were the only scores to be externally validated. Except for HPRO which shows some promise for use in a clinical setting (based on predictive performance and external validation), none of the identified risk scores can be considered ready for use. Further research is urgently warranted within the field.

3. Antibacterial Prophylaxis for Surgical Site Infection in the Elderly: Practical Application.

Author(s): Cataldo, Maria Adriana; Granata, Guido; Petrosillo, Nicola

Source: Drugs & aging; Jul 2017; vol. 34 (no. 7); p. 489-498

Publication Date: Jul 2017

Publication Type(s): Journal Article

PubMedID: 28589466

Abstract: Surgical site infections are among the most common healthcare-associated infections and are linked with increased length of hospitalization, re-admission, mortality and significant financial burden. Risk factors for the occurrence of surgical site infections include variables related to the surgical procedure as well as host factors. Increasing age is associated with the occurrence of surgical site infections. The aim of this review is to give an update on the antibiotic prophylaxis for surgical site infection in elderly people. We focused on specific issues and practical applications, such as the importance of targeting the antimicrobial agent to the susceptibility pattern of colonizing flora in selected cases and the need for dosage modifications.

4. Effect of a Standardized Protocol of Antibiotic Therapy on Surgical Site Infection after Laparoscopic Surgery for Complicated Appendicitis.

Author(s): Park, Hyoung-Chul; Kim, Min Jeong; Lee, Bong Hwa

Source: Surgical infections; Jun 2017

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28631985

Abstract:BACKGROUNDAlthough it is accepted that complicated appendicitis requires antibiotic therapy to prevent post-operative surgical infections, consensus protocols on the duration and regimens of treatment are not well established. This study aimed to compare the outcome of post-operative infectious complications in patients receiving old non-standardized and new standard antibiotic protocols, involving either 5 or 10 days of treatment, respectively.METHODSWe enrolled 1,343 patients who underwent laparoscopic surgery for complicated appendicitis between January 2009 and December 2014. At the beginning of the new protocol, the patients were divided into two groups; 10 days of various antibiotic regimens (between January 2009 and June 2012, called the non-standardized protocol; n = 730) and five days of cefuroxime and metronidazole regimen (between July 2012 and December 2014; standardized protocol; n = 613). We compared the clinical outcomes, including surgical site infection (SSI) (superficial and deep organ/space infections) in the two groups.RESULTSThe standardized protocol group had a slightly shorter operative time (67 vs. 69 min), a shorter hospital stay (5 vs. 5.4 d), and lower medical cost (US$1,564 vs. US$1,654). Otherwise, there was no difference between the groups. No differences were found in the non-standardized and standard protocol groups with regard to the rate of superficial infection (10.3% vs. 12.7%; p = 0.488) or deep organ/space infection (2.3% vs. 2.1%; p = 0.797).CONCLUSIONSIn patients

undergoing laparoscopic surgery for complicated appendicitis, five days of cefuroxime and metronidazole did not lead to more SSIs, and it decreased the medical costs compared with non-standardized antibiotic regimens.

5. The Benefits of a Wound Protector in Preventing Incisional Surgical Site Infection in Elective Open Digestive Surgery: A Large-Scale Cohort Study.

Author(s): Itatsu, Keita; Yokoyama, Yukihiro; Sugawara, Gen; Kamiya, Satoaki; Terasaki, Masaki; Morioka, Atsushi; Iyomasa, Shinsuke; Shirai, Kazuhisa; Ando, Masahiko; Nagino, Masato

Source: World journal of surgery; Jun 2017

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28608019

Abstract:BACKGROUNDThe objective of this study was to evaluate the benefits of wound protectors (WPs) in preventing incisional surgical site infection (I-SSI) in open elective digestive surgery using data from a large-scale, multi-institutional cohort study.METHODSPatients who had elective digestive surgery for malignant neoplasms between November 2009 and February 2011 were included. The protective value of WPs against I-SSI was evaluated.RESULTSA total of 3201 patients were analyzed. A WP was used in 1022 patients (32%). The incident rate of I-SSI (not including organ/space SSI) was 9%. In the univariate and the multivariate analyses for perioperative risk factors for I-SSI, the use of WP was an independent favorable factor that reduced the incidence of I-SSI (odds ratio 0.73, 95% confidence interval 0.55-0.98. P = 0.038). The subgroup forest plot analyses revealed that WP reduced the risk of I-SSI only in patients aged 74 years or younger, males, non-obese patients (body mass index <25 kg/m2), patients with an American Society of Anesthesiologists score of 1/2, patients with a previous history of laparotomy, non-smokers, and patients who underwent colon and rectum operations. In patients who underwent colorectal surgery, the postoperative hospital stay was significantly shorter in patients with WP than those without WP (median 13 vs. 15 days, P = 0.040). In terms of the depth of SSI, WP only prevented superficial I-SSI and did not reduce the incidence of deep I-SSI.CONCLUSIONSWP is a useful device for preventing superficial I-SSI in open elective digestive surgery.TRIAL REGISTRATION NUMBERUMIN000004723.

6. Surgical site infection after cesarean delivery: incidence and risk factors at a US academic institution.

Author(s): Moulton, Laura J; Munoz, Jessian L; Lachiewicz, Mark; Liu, Xiaobo; Goje, Oluwatosin

Source: The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians; Jun 2017 ; p. 1-8

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28502188

Abstract:PURPOSETo identify the rate of surgical site infection (SSI) after Cesarean delivery (CD) and determine risk factors predictive for infection at a large academic institution.METHODSThis was a retrospective cohort study in women undergoing CD during 2013. SSIs were defined by Centers for Disease Control (CDC) criteria. Chi square and t-tests were used for bivariate analysis and multivariate logistic regression was used to identify SSI risk factors.RESULTSIn 2419 patients, the rate of SSI was 5.5% (n = 133) with cellulitis in 4.9% (n = 118), deep incisional infection in 0.6% (n = 15) and intra-abdominal infection in 0.3% (n = 7). On multivariate analysis, SSI was higher among CD for

labor arrest (OR 2.4; 95%CI 1.6-3.5; p <.001). Preterm labor (OR 2.8; 95%CI 1.3-6.0; p = .01) and general anesthesia (OR 4.4; 95%CI 2.0-9.8; p = .003) were predictive for SSI. Increasing BMI (OR 1.1; 95%CI 1.05-1.09; p = .02), asthma (OR 1.9; 95%CI 1.1-3.2; p = .02) and smoking (OR 1.9; 95%CI 1.1-3.2; p = .02) were associated with increased SSI.CONCLUSIONSSeveral patient and surgical variables are associated with increased rate of SSI after CD. Identification of risk factors for SSI after CD is important for targeted implementation of quality improvement measures and infection control interventions.

7. Preoperative chlorhexidine versus povidone-iodine antisepsis for preventing surgical site infection: A Meta-analysis and trial sequential analysis of randomized controlled trials.

Author(s): Zhang, Dan; Wang, Xi-Chen; Yang, Zeng-Xi; Gan, Jian-Xin; Pan, Jie-Bin; Yin, Lan-Ning

Source: International journal of surgery (London, England); Jun 2017

Publication Date: Jun 2017

Publication Type(s): Journal Article Review

PubMedID: 28583892

Abstract:BACKGROUNDSUpdated guidelines for surgical site infections (SSIs) suggested that chlorhexidine (CH) or povidone-iodine (PVI) product was equally appropriate to be applied in preoperative disinfection, but which one was optimal remained ambiguous. Moreover, recent studies reported inconsistent results. Thus, an updated meta-analysis was conducted to clarify the superiority of CH or PVI for prevention of SSIs in clean and clean-contaminated surgery.METHODSFrom the inception to November 2016, Pubmed, Embase, and the Cochrane library were systematically searched for randomized controlled trials (RCTs) which explored preoperative antisepsis schemes (CH or PVI) for prevention of SSIs in clean and clean-contaminated surgery. Relative risks (RRs) with 95% confidence interval (CI) were calculated using random effects model. Furthermore, subgroup analysis, sensitive analysis, and trial sequential analysis (TSA) were applied to estimate whether overall pooled effect was enough credible and robust.RESULTSThirteen RCTs involving 6997 patients (3352 in CH and 3645 in PVI group) undergoing clean and clean-contaminated surgeries were included in our meta-analysis. Compared with PVI, preoperative CH antisepsis was associated with lower incidence of SSIs (RR, 0.70; 95%CI, 0.60-0.83, I2=0). Additionally, subgroup analysis, sensitive analysis, and TSA indicated that the current available evidence was reliable and robust.CONCLUSIONSCH should be more preferentially recommended for preoperative skin preparation as compared with PVI in clean and clean-contaminated surgery.

8. Current outcomes and predictors of treatment failure in patients with surgical site infection after elective colorectal surgery. A multicentre prospective cohort study.

Author(s): Gomila, Aina; Badia, Josep Ma; Carratalà, Jordi; Serra-Aracil, Xavier; Shaw, Evelyn; Diaz-Brito, Vicens; Castro, Antoni; Espejo, Elena; Nicolás, Carmen; Piriz, Marta; Brugués, Montserrat; Obradors, Josefina; Lérida, Ana; Cuquet, Jordi; Limón, Enric; Gudiol, Francesc; Pujol, Miquel; VINCat Colon Surgery Group

Source: The Journal of infection; Jun 2017; vol. 74 (no. 6); p. 555-563

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28315721

Abstract:OBJECTIVETo determine current outcomes and predictors of treatment failure among patients with surgical site infection (SSI) after colorectal surgery.METHODSA multicentre observational prospective cohort study of adults undergoing elective colorectal surgery in 10 Spanish

hospitals (2011-2014). Treatment failure was defined as persistence of signs/symptoms of SSI or death at 30 days post-surgery.RESULTSOf 3701 patients, 669 (18.1%) developed SSI; 336 (9.1%) were organ-space infections. Among patients with organ-space SSI, 81.2% required source control: 60.4% reoperation and 20.8% percutaneous/transrectal drainage. Overall treatment failure rate was 21.7%: 9% in incisional SSIs and 34.2% in organ-space SSIs ($p < 0.001$). Median length of stay was 15 days (IQR 9-22) for incisional SSIs and 24 days (IQR 17-35) for organ-space SSIs ($p < 0.001$). One hundred and twenty-seven patients (19%) required readmission and 35 patients died (5.2%). Risk factors for treatment failure among patients with organ-space SSI were age ≥65 years (OR 1.83, 95% CI: 1.07-1.83), laparoscopy (OR 1.7, 95% CI: 1.06-2.77), and reoperation (OR 2.8, 95% CI: 1.7-4.6).CONCLUSIONSRates of SSI and treatment failure in organ-space SSI after elective colorectal surgery are notably high. Careful attention should be paid to older patients with previous laparoscopy requiring reoperation for organ-space SSI, so that treatment failure can be identified early.

9. The "bundle" approach to reduce the surgical site infection rate.

Author(s): Bert, Fabrizio; Giacomelli, Sebastian; Amprino, Viola; Pieve, Giulio; Ceresetti, Daniela; Testa, Marco; Zotti, Carla M

Source: Journal of evaluation in clinical practice; Jun 2017; vol. 23 (no. 3); p. 642-647

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28145067

Abstract:RATIONALE, AIMS, AND OBJECTIVESIn Italy, since 2008, the surveillance of surgical site infections (SSIs) has been conducted following ECDC recommendations, according to the protocol of the National System of Surveillance of Surgical Site Infections. In 2009, in Piedmont region, where the study was conducted, it was introduced a survey of a "bundle" for every patient under SSIs surveillance. The bundle includes 5 items: infection risk index calculation, preoperative shower, trichotomy, antibiotic prophylaxis, and body temperature control. The aim of this study is the evaluation of the incidence rate of the SSIs in relation to the implementation of the bundle from January 1st to December 31st, 2012.METHODThis study is an observational study (retrospective cohort). The regional surveillance system collected 3314 surgical operations during the year 2012 from 37 hospitals. The represented surgical categories were hip prosthetic surgery (HPRO: 1992 cases) and colon surgery (COLO: 1322 cases). The bundle was implemented in 1114 and 671 operations, respectively. Univariate and multivariate analysis were conducted stratifying the sample for hip surgery and colorectal surgery, with the purpose to identify an association between the implementation of the bundle and a decrease of the rate of SSIs.RESULTSFrom the analysis, the bundle resulted as a protective factor for the infection risk in colon surgery (odds ratio [OR], 0.55; 95% confidence interval [CI], 0.38-0.78). The main risk factors were American Society of Anesthesiologists score ≥ 3 (OR, 1.57; 95% CI, 1.10-2.24) and contamination class ≥ 3 (OR, 2.02; 95% CI, 1.37-2.97). In the hip surgery, the application of the bundle was not statistically associated to a decrease of the risk of infection.CONCLUSIONThe use of surgical bundle seems to reduce significantly the SSIs rate in the colon surgery.

10. A Multifaceted Approach to Reduce Surgical Site Infection After Cesarean Birth.

Author(s): Pearlman, Maureen; Mattyasovszky, Beatrix

Source: JOGNN: Journal of Obstetric, Gynecologic & Neonatal Nursing; Jun 2017; vol. 46

Publication Date: Jun 2017

Publication Type(s): Academic Journal

Abstract: The article discusses a study aimed at reducing surgical site infections in pregnant women after cesarean birth. Topics discussed include implementation of patient education and communication for the study, implications of this study for the clinical practice, and health care provider and staff education.

11. Evaluation of the Bundle "Zero Surgical Site Infection" to Prevent Surgical Site Infection in Vascular Surgery.

Author(s): Fernández-Prada, María; Martínez-Ortega, Carmen; Revuelta-Mariño, Livia; Menéndez-Herrero, Ángeles; Navarro-Gracia, Juan F

Source: Annals of vascular surgery; May 2017; vol. 41 ; p. 160-168

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 28263778

Abstract:BACKGROUNDTo compare the incidence of surgical site infections (SSIs) before and after the implementation of a bundle of care called "Zero Surgical Site Infection." Secondary goals included estimating measures of association and their potential impact, determining care management indicators in vascular surgery, and evaluating the level of compliance with the bundle.METHODSThis is a prospective observational study with a historic control group. The bundle included (1) removal of body hair with clippers; (2) preoperative showering with chlorhexidine soap; (3) preparation of the surgical field with alcoholic chlorhexidine 2%; (4) adequacy of antimicrobial prophylaxis; (5) intraoperative and (6) postoperative glycemic and central temperature control. Student's t-test and chi-squared test were performed. Relative risk, attributable risk, number needed to treat, and preventable fraction were used as association and impact measures.RESULTSIn total, 192 patients were included. The overall incidence of SSI was 8.85%; the preventive fraction was 59.1%. The rate of incidence of SSI for clean surgery was reduced from 4.9% to 0% (P = 0.127), whereas the average hospital stay decreased from 22.38 to 13.70 days (P = 0.002). Concerning contaminated surgery, significant differences were found in the rate of incidence of SSI (33.3% vs. 13.9%, P = 0.035). Compliance with the bundle of preoperative and intraoperative measures exceeded 95% and almost reached 50%, respectively. Compliance with the bundle of postoperative measures reached 25%.CONCLUSIONSThis bundle has demonstrated to be effective in reducing the incidence of SSI in vascular surgery. The publication of these initial results should encourage the implementation of this bundle at national level.

12. Nasal decontamination for the prevention of surgical site infection in Staphylococcus aureus carriers.

Author(s): Liu, Zhenmi; Norman, Gill; Iheozor-Ejiofor, Zipporah; Wong, Jason Kf; Crosbie, Emma J; Wilson, Peter

Source: The Cochrane database of systematic reviews; May 2017; vol. 5 ; p. CD012462

Publication Date: May 2017

Publication Type(s): Journal Article Review

PubMedID: 28516472

Available in full text at Cochrane Library, The - from John Wiley and Sons

Abstract:BACKGROUNDSurgical site infection rates in the month following surgery vary from 1% to 5%. Due to the large number of surgical procedures conducted annually, the costs of these surgical

site infections (SSIs) can be considerable in financial and social terms. Nasal decontamination using antibiotics or antiseptics is performed to reduce the risk of SSIs by preventing organisms from the nasal cavity being transferred to the skin where a surgical incision will be made. Staphylococcus aureus (S aureus) colonises the nasal cavity and skin of carriers and can cause infection in open or unhealed surgical wounds. S aureus is the leading nosocomial (hospital-acquired) pathogen in hospitals worldwide. The potential effectiveness of nasal decontamination of S aureus is thought to be dependent on both the antibiotic/antiseptic used and the dose of application; however, it is unclear whether nasal decontamination actually reduces postoperative wound infection in S aureus carriers.OBJECTIVESTo assess the effects of nasal decontamination on preventing surgical site infections (SSIs) in people who are S aureus carriers undergoing surgery.SEARCH METHODSIn September 2016 we searched the Cochrane Wounds Specialised Register, the Cochrane Central Register of Controlled Trials (CENTRAL) (the Cochrane Library), Ovid MEDLINE, Ovid MEDLINE (In-Process & Other Non-Indexed Citations), Ovid Embase, and EBSCO CINAHL Plus. We also searched three clinical trial registries and the references of included studies and relevant systematic reviews. There were no restrictions based on language, date of publication or study setting.SELECTION CRITERIARandomised controlled trials (RCTs) which enrolled S aureus carriers with any type of surgery and assessed the use of nasal decontamination with antiseptic/antibiotic properties were included in the review.DATA COLLECTION AND ANALYSISTwo review authors independently performed study selection, data extraction, risk of bias assessment and GRADE assessment.MAIN RESULTSWe located two studies (291 participants) for inclusion in this review. The trials were clinically heterogeneous with differences in duration of follow-up, and nasal decontamination regimens. One study compared mupirocin (2% contained in a base of polyethylene glycol 400 and polyethylene glycol 3350) with a placebo in elective cardiac surgery patients; and one study compared Anerdian (iodine 0.45% to 0.57% (W/V), chlorhexidine acetate 0.09% to 0.11% (W/V)) with no treatment also in cardiac surgery patients. The trials reported limited outcome data on SSI, adverse events and secondary outcomes (e.g. S aureus SSI, mortality). Mupirocin compared with placeboThis study found no clear difference in SSI risk following use of mupirocin compared with placebo (1 trial, 257 participants); risk ratio (RR) 1.60, 95% confidence interval (CI) 0.79 to 3.25 based on 18/130 events in the mupirocin group and 11/127 in the control group; low-certainty evidence (downgraded twice due to imprecision). Anerdian compared with no treatmentIt is uncertain whether there is a difference in SSI risk following treatment with Anerdian compared with no treatment (1 trial, 34 participants); RR 0.89, 95% CI 0.06 to 13.08 based on 1/18 events in the Anerdian group and 1/16 in the control group; very low certainty evidence (downgraded twice due to imprecision and once due to risk of bias).AUTHORS' CONCLUSIONSThere is currently limited rigorous RCT evidence available regarding the clinical effectiveness of nasal decontamination in the prevention of SSI. This limitation is specific to the focused question our review addresses, looking at nasal decontamination as a single intervention in participants undergoing surgery who are known S aureus carriers. We were only able to identify two studies that met the inclusion criteria for this review and one of these was very small and poorly reported. The potential benefits and harms of using decontamination for the prevention of SSI in this group of people remain uncertain.

13. Centers for Disease Control and Prevention Guideline for the Prevention of Surgical Site Infection, 2017.

Author(s): Berríos-Torres, Sandra I; Umscheid, Craig A; Bratzler, Dale W; et al; Healthcare Infection Control Practices Advisory Committee

Source: JAMA surgery; May 2017

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 28467526

Available in full text at JAMA surgery [JAMA Surg] NLMUID: 101589553 - from EBSCOhost

Abstract: ImportanceThe human and financial costs of treating surgical site infections (SSIs) are increasing. The number of surgical procedures performed in the United States continues to rise, and surgical patients are initially seen with increasingly complex comorbidities. It is estimated that approximately half of SSIs are deemed preventable using evidence-based strategies.ObjectiveTo provide new and updated evidence-based recommendations for the prevention of SSI.Evidence ReviewA targeted systematic review of the literature was conducted in MEDLINE, EMBASE, CINAHL, and the Cochrane Library from 1998 through April 2014. A modified Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) approach was used to assess the quality of evidence and the strength of the resulting recommendation and to provide explicit links between them. Of 5487 potentially relevant studies identified in literature searches, 5759 titles and abstracts were screened, and 896 underwent full-text review by 2 independent reviewers. After exclusions, 170 studies were extracted into evidence, evaluated, and categorized.FindingsBefore surgery, patients should shower or bathe (full body) with soap (antimicrobial or nonantimicrobial) or an antiseptic agent on at least the night before the operative day. Antimicrobial prophylaxis should be administered only when indicated based on published clinical practice guidelines and timed such that a bactericidal concentration of the agents is established in the serum and tissues when the incision is made. In cesarean section procedures, antimicrobial prophylaxis should be administered before skin incision. Skin preparation in the operating room should be performed using an alcohol-based agent unless contraindicated. For clean and clean-contaminated procedures, additional prophylactic antimicrobial agent doses should not be administered after the surgical incision is closed in the operating room, even in the presence of a drain. Topical antimicrobial agents should not be applied to the surgical incision. During surgery, glycemic control should be implemented using blood glucose target levels less than 200 mg/dL, and normothermia should be maintained in all patients. Increased fraction of inspired oxygen should be administered during surgery and after extubation in the immediate postoperative period for patients with normal pulmonary function undergoing general anesthesia with endotracheal intubation. Transfusion of blood products should not be withheld from surgical patients as a means to prevent SSI.Conclusions and RelevanceThis guideline is intended to provide new and updated evidence-based recommendations for the prevention of SSI and should be incorporated into comprehensive surgical quality improvement programs to improve patient safety.

14. Impact of surgical site infection on healthcare costs and patient outcomes: a systematic review in six European countries.

Author(s): Badia, J.M.; Casey, A.L.; Petrosillo, N.; Hudson, P.M.; Mitchell, S.A.; Crosby, C.

Source: Journal of Hospital Infection; May 2017; vol. 96 (no. 1); p. 1-15

Publication Date: May 2017

Publication Type(s): Academic Journal

PubMedID: 28410761

Abstract: Background: Surgical site infections (SSIs) are associated with increased morbidity and mortality. Furthermore, SSIs constitute a financial burden and negatively impact on patient quality of life (QoL).Aim: To assess, and evaluate the evidence for, the cost and health-related QoL (HRQoL) burden of SSIs across various surgical specialties in six European countries.Methods: Electronic databases and conference proceedings were systematically searched to identify studies reporting the cost and HRQoL burden of SSIs. Studies published post 2005 in France, Germany, the Netherlands, Italy, Spain, and the UK were eligible for data extraction. Studies were categorized by surgical specialty, and the primary outcomes were the cost of infection, economic evaluations, and HRQoL.Findings: Twenty-six studies met the eligibility criteria and were included for analysis. There

was a paucity of evidence in the countries of interest; however, SSIs were consistently associated with elevated costs, relative to uninfected patients. Several studies reported that SSI patients required prolonged hospitalization, reoperation, readmission, and that SSIs increased mortality rates. Only one study reported QoL evidence, the results of which demonstrated that SSIs reduced HRQoL scores (EQ-5D). Hospitalization reportedly constituted a substantial cost burden, with additional costs arising from medical staff, investigation, and treatment costs.Conclusion: Disparate reporting of SSIs makes direct cost comparisons difficult, but this review indicated that SSIs are extremely costly. Thus, rigorous procedures must be implemented to minimize SSIs. More economic and QoL studies are required to make accurate cost estimates and to understand the true burden of SSIs.

15. Waterless Hand Rub versus Traditional Hand Scrub Methods for Preventing the Surgical-Site Infection in Orthopaedic Surgery.

Author(s): Iwakiri, Kentaro; Kobayashi, Akio; Seki, Masahiko; Ando, Yoshiyuki; Tsujio, Tadao; Hoshino, Masatoshi; Nakamura, Hiroaki

Source: Spine; Apr 2017

Publication Date: Apr 2017

Publication Type(s): Journal Article

PubMedID: 28422796

Abstract:STUDY DESIGNA retrospective cohort study with prospectively collected data OBJECTIVE.: The aim of this study was to compare SSI incidences, the cost of hand hygiene agents, and hand hygiene time between the traditional hand scrub and the waterless hand rub protocols before orthopaedic surgery.SUMMARY OF BACKGROUND DATASurgical-site-infections (SSI) prolong hospitalization and are a leading nosocomial cause of morbidity as well as a source of excess cost. Recently, a waterless hand rub protocol comprising alcohol based chlorhexidine gluconate for use before surgery was developed, but no studies have yet examined its utility in orthopaedic surgery.METHODSFourteen hundred consecutive patients who underwent orthopaedic surgery (spine, joint replacement, hand and trauma surgeries) in our hospital since April 1, 2012 were included. 712 cases underwent following traditional hand scrub between April 1, 2012 and April 30, 2013 and 688 cases underwent following waterless hand rub between June 1, 2013 and April 30, 2014. We compared SSI incidences within all and each subcategory between two hand hygiene protocols. All patients were screened for SSI within 1 year after surgery. We compared the cost of hand hygiene agents and hand hygiene time between two groups.RESULTSThe SSI incidences were 1.3% (9 of 712) following the traditional protocol (2 deep and 7 superficial infections) and 1.1% (8 of 688) following the waterless protocol (all superficial infections). There were no significant differences between the two groups. The costs of liquids used for one hand hygiene were about $2 for traditional hand scrub and less than $1 for waterless hand rub. The mean hand hygiene time was 264 seconds with the traditional protocol and 160 seconds with the waterless protocol.CONCLUSIONWaterless hand rub with an alcohol based chlorhexidine gluconate solution can be a safe, quick, and cost-effective alternative to traditional hand scrub. (299 words)Level of Evidence: 3.

Group A Strep

1. Evolutionary Constraints Shaping Streptococcus pyogenes-Host Interactions.

Author(s): Wilkening, Reid V; Federle, Michael J

Source: Trends in microbiology; Jul 2017; vol. 25 (no. 7); p. 562-572

Publication Date: Jul 2017

Publication Type(s): Journal Article Review

PubMedID: 28216292

Abstract: Research on the Gram-positive human-restricted pathogen Streptococcus pyogenes (Group A Streptococcus, GAS) has long focused on invasive illness, the most severe manifestations of GAS infection. Recent advances in descriptions of molecular mechanisms of GAS virulence, coupled with massive sequencing efforts to isolate genomes, have allowed the field to better understand the molecular and evolutionary changes leading to pandemic strains. These findings suggest that it is necessary to rethink the dogma involving GAS pathogenesis, and that the most productive avenues for research going forward may be investigations into GAS in its 'normal' habitat, the nasopharynx, and its ability to either live with its host in an asymptomatic lifestyle or as an agent of superficial infections. This review will consider these advances, focusing on the natural history of GAS, the evolution of pandemic strains, and novel roles for several key virulence factors that may allow the field to better understand their physiological role.

2. Performance of the matrix-assisted laser desorption ionization time-of-flight mass spectrometry system for rapid identification of streptococci: a review.

Author(s): Fan, W-T; Qin, T-T; Bi, R-R; Kang, H-Q; Ma, P; Gu, B

Source: European journal of clinical microbiology & infectious diseases : official publication of the European Society of Clinical Microbiology; Jun 2017; vol. 36 (no. 6); p. 1005-1012

Publication Date: Jun 2017

Publication Type(s): Journal Article Review

PubMedID: 28116553

Abstract: Matrix-assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF MS) has been developed as a new type of soft ionization mass spectrometry in recent years. An increasing number of clinical microbiological laboratories consider it as an innovative approach for bacterial identification. This study was undertaken in order to evaluate the use of MALDI-TOF MS for rapid identification of the clinical streptococci. A systematic review was conducted based on a literature search of the Medline and Embase databases. Fixed-effects models based on the P-value and the I-square were used for meta-analysis while considering the possibility of heterogeneity between studies. Statistical analyses were performed by using STATA 11.0. Twenty-seven studies covering 3,540 streptococci were included in our meta-analysis. The MALDI-TOF MS correctly identified the species of 96% (I2 = 92.8, P 0.1), and 100% of Streptococcus agalactiae (I2 = 20.7%, P > 0.2). What's more, it also had high confidence in other Streptococcus. But the accuracy of bovis needs to be improved. The overall performance of both MALDI-MS systems was different. Notably, the identifying accuracy rate of streptococci by VITEK MS was 98%, compared to 94% by the MALDI biotyper system. Interestingly, when analyzing the incorrect identification of MALDI-TOF MS, 36 out of the 38 strains of Streptococcus mitis/oralis were inaccurately identified as Streptococcus pneumoniae by the MALDI biotyper system. In conclusion, the results of this review indicated that MALDI-TOF MS could be a reliable and rapid method for identification of the streptococci.

3. Short and long-term outcomes of Streptococcus pyogenes pneumonia managed in the intensive care unit.

Author(s): Lecronier, Marie; Elabbadi, Alexandre; Mekontso Dessap, Armand; de Prost, Nicolas

Source: Infectious diseases (London, England); May 2017 ; p. 1-3

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 28502192

4. Evaluation of the Potency, Neutralizing Antibody Response, and Stability of a Recombinant Fusion Protein Vaccine for Streptococcus pyogenes.

Author(s): Burlet, E; HogenEsch, H; Dunham, A; Morefield, G

Source: The AAPS journal; May 2017; vol. 19 (no. 3); p. 875-881

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 28283948

Abstract: Streptococcus pyogenes or group A streptococcus (GAS) is a Gram-positive bacterium that can cause a wide range of diseases, including pharyngitis, impetigo, scarlet fever, necrotizing fasciitis, rheumatic fever, and streptococcal toxic shock syndrome. Despite the increasing burden on global health caused by GAS, there is currently no licensed vaccine available. In this study, we evaluated immunogenicity, induction of neutralizing antibodies, and stability of a new recombinant fusion protein vaccine that targets infections from GAS. The recombinant fusion protein (SpeAB) combines inactive mutant forms of streptococcal pyrogenic exotoxin A (SpeA) and streptococcal pyrogenic exotoxin B (SpeB). The SpeAB vaccine evaluated in this study was adsorbed to an aluminum adjuvant and demonstrated robust immunogenicity, eliciting production of specific neutralizing antibodies against SpeA and SpeB, two major virulence factors of S. pyogenes. Stability studies suggest that the vaccine will retain immunogenicity for at least 2 years when stored at refrigerated temperatures. This novel vaccine shows great potential to provide protection against GAS infections and to reduce the burden of GAS disease globally.

5. The use of rapid test QuikRead go® Strep A in bacterial pharyngotonsillitis diagnosing and therapeutic decisions.

Author(s): Stefaniuk, E; Bosacka, K; Wanke-Rytt, M; Hryniewicz, W

Source: European journal of clinical microbiology & infectious diseases : official publication of the European Society of Clinical Microbiology; Apr 2017

Publication Date: Apr 2017

Publication Type(s): Journal Article

PubMedID: 28429165

Abstract: Group A Streptococci (GAS) are the main causative agents of bacterial pharyngitis, which require antibiotic therapy. Rapid diagnostic tests detecting GAS combined with Centor/McIsaac score enable accurate differential diagnosis (viral vs. bacterial) and prompt commencement of targeted treatment. The aim of this study was to assess the specificity, sensitivity, PPV and NPV of QuikRead go® Strep A (Orion Diagnostica Oy, Finland) recommended for the detection of GAS in pharyngeal swabs. Quick diagnostic test results were compared with physical examination findings, Centor/McIsaac score and results of reference testing (conventional microbial cultures). The study group of 96 participants consisted of 44 women (46%) and 52 men (54%); children aged 3-14 years constituted 46% of the patients. S. pyogenes were cultured from 43 of 96 pharyngeal swabs. Almost half of all positive samples (47%, n = 20) were collected from children aged 3 to 14 years. Positive GAS cultures were confirmed in 33% of patients with Centor/McIsaac score of 2 points, 48% of patients with score of 3, and 50% of patients with score of 4-5. Microbial cultures confirmed the positive results of QuikRead go® Strep A test in 83% of cases. Test specificity and sensitivity were

calculated for the entire study group, which were 85% and 91%, respectively. The PPV of the test was 83% and its NPV was 92%. Using quick tests to detect GAS antigens appears a good alternative to conventional microbial diagnosis of strep throat, as it enables making a diagnosis and deciding on treatment plan in one appointment.

6. Importance of adhesins in the recurrence of pharyngeal infections caused by Streptococcus pyogenes.

Author(s): Wozniak, Aniela; Scioscia, Natalia; Geoffroy, Enrique; Ponce, Iván; García, Patricia

Source: Journal of medical microbiology; Apr 2017; vol. 66 (no. 4); p. 517-525

Publication Date: Apr 2017

Publication Type(s): Journal Article

PubMedID: 28463664

Abstract:PURPOSEPharyngo-amygdalitis is the most common infection caused by Streptococcus pyogenes (S. pyogenes). Reinfection with strains of different M types commonly occurs. However, a second infection with a strain of the same M type can still occur and is referred to as recurrence. We aimed to assess whether recurrence of S. pyogenes could be associated to erythromycin resistance, biofilm formation or surface adhesins like fibronectin-binding proteins and pilus proteins, both located in the fibronectin-binding, collagen-binding, T-antigen (FCT) region.METHODOLOGYWe analyed clinical isolates of S. pyogenes obtained from children with multiple positive cultures of throat swabs. We analysed potential associations between M types, clonal patterns, biofilm production and FCT types with their capacity of producing a recurrent infection. We genetically defined recurrence as an infection with the same M type (same strain) and reinfection as an infection with a different M type.RESULTSNo differences were observed between recurrent and reinfection isolates in relation to erythromycin resistance, presence and number of domains of prtF1 gene, and biofilm formation capacity; the only significant difference was the higher frequency of FCT-4 type among recurrent isolates. However, when all the factors that could contribute to recurrence (erythromycin resistance, biofilm production, presence of prtF1 gene and FCT-4 type) were analysed together, we observed that recurrent isolates have a higher number of factors than reinfection isolates.CONCLUSIONSRecurrence seems not to be associated with biofilm formation. However, pili and fibronectin-binding proteins could be associated with recurrence because FCT-4 isolates which harbour two fibronectin-binding proteins are more frequent among recurrent isolates.

7. Group A Streptococcus, Acute Rheumatic Fever and Rheumatic Heart Disease: Epidemiology and Clinical Considerations.

Author(s): Zühlke, Liesl J; Beaton, Andrea; Engel, Mark E; Hugo-Hamman, Christopher T; Karthikeyan, Ganesan; Katzenellenbogen, Judith M; Ntusi, Ntobeko; Ralph, Anna P; Saxena, Anita; Smeesters, Pierre R; Watkins, David; Zilla, Peter; Carapetis, Jonathan

Source: Current treatment options in cardiovascular medicine; Feb 2017; vol. 19 (no. 2); p. 15

Publication Date: Feb 2017

Publication Type(s): Journal Article Review

PubMedID: 28285457

Abstract:OPINION STATEMENTEarly recognition of group A streptococcal pharyngitis and appropriate management with benzathine penicillin using local clinical prediction rules together with validated rapi-strep testing when available should be incorporated in primary health care. A directed approach to the differential diagnosis of acute rheumatic fever now includes the concept of low-risk

versus medium-to-high risk populations. Initiation of secondary prophylaxis and the establishment of early medium to long-term care plans is a key aspect of the management of ARF. It is a requirement to identify high-risk individuals with RHD such as those with heart failure, pregnant women, and those with severe disease and multiple valve involvement. As penicillin is the mainstay of primary and secondary prevention, further research into penicillin supply chains, alternate preparations and modes of delivery is required.

Salmonella

1. The Epidemiology of Childhood Salmonella Infections in Alberta, Canada.

Author(s): Faulder, Kate E; Simmonds, Kimberley; Robinson, Joan L

Source: Foodborne pathogens and disease; Jun 2017; vol. 14 (no. 6); p. 364-369

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28306338

Abstract:OBJECTIVESThe objectives were to describe the incidence, demographics, laboratory findings, and suspected sources of childhood Salmonella infections in Alberta, Canada, with a focus on preventable cases.METHODSData from Notifiable Disease Reports for children with nontyphoidal salmonellosis (NTS) or typhoid/paratyphoid fever from 2007 through 2015 were analyzed.RESULTSNTS was detected from 2285 children. Bacteremia was documented in 55 cases (2.4%), whereas a single infant had NTS meningitis. The suspected source was food (N = 577; 25.3%) followed by animal or animal manure contact (N = 426; 18.6%), of which a reptile was the suspected source in 264 cases (11.5%). There were 44 outbreaks with none sharing the same food source. Ninety-five children were diagnosed with typhoid/paratyphoid fever, of which 48 cases (51%) were typhoid cases in unimmunized children 2 years or older.CONCLUSIONSThere are still ∼275 pediatric cases of Salmonella infection in Alberta annually, the bulk of which are preventable.APPLICATIONPublic education about reptile exposure, food safety, and pretravel immunizations could potentially prevent many cases of Salmonella infection.

2. Urinary Tract Infections Due to Nontyphoidal Salmonella.

Author(s): Gorelik, Yuri; Paul, Mical; Geffen, Yuval; Khamaisi, Mogher

Source: The American journal of the medical sciences; Jun 2017; vol. 353 (no. 6); p. 529-532

Publication Date: Jun 2017

Publication Type(s): Journal Article

PubMedID: 28641715

Abstract:BACKGROUNDWe sought to establish the characteristics of symptomatic nontyphoidal Salmonella (NTS) urinary tract infection (UTI) without concomitant gastroenteritis (GE) as a separate clinical entity.MATERIALS AND METHODSWe conducted a retrospective cohort single-center study and reviewed all cases of NTS bacteriuria between 1995 and 2016. Patients were assigned to a group according to their clinical presentation, namely, symptomatic NTS UTI without GE, GE with NTS bacteriuria or isolated asymptomatic NTS bacteriuria. We compared the characteristics of patients in the NTS UTI group to those of the latter 2 groups.RESULTSNTS bacteriuria was found in 77 patients, of which 61 had records available for review. Twenty-one patients (including 17 adults) presented with NTS UTI, 30 patients presented with features of GE with NTS bacteriuria and 10 patients had asymptomatic NTS bacteriuria. NTS UTI was not significantly associated with older age, male sex, diabetes, immunosuppressive states or urologic abnormalities. There was a significant difference in

the proportion of patients with an underlying urologic malignancy in the NTS UTI group (4 of 17 patients [23.5%]) as compared to those in the other groups (0 of 24 patients), P = 0.023.CONCLUSIONSA unique group of patients with symptomatic NTS UTI without GE was identified. A significant association with urologic malignancies was demonstrated in patients with NTS UTI compared to those with GE and NTS bacteriuria or asymptomatic NTS bacteriuria.

3. Salmonella Typhimurium Diarrhea Reveals Basic Principles of Enteropathogen Infection and Disease-Promoted DNA Exchange.

Author(s): Wotzka, Sandra Y; Nguyen, Bidong D; Hardt, Wolf-Dietrich

Source: Cell host & microbe; Apr 2017; vol. 21 (no. 4); p. 443-454

Publication Date: Apr 2017

Publication Type(s): Journal Article Review

PubMedID: 28407482

Abstract: Despite decades of research, efficient therapies for most enteropathogenic bacteria are still lacking. In this review, we focus on Salmonella enterica Typhimurium (S. Typhimurium), a frequent cause of acute, self-limiting food-borne diarrhea and a model that has revealed key principles of enteropathogen infection. We review the steps of gut infection and the mucosal innate-immune defenses limiting pathogen burdens, and we discuss how inflammation boosts gut luminal S. Typhimurium growth. We also discuss how S. Typhimurium-induced inflammation accelerates the transfer of plasmids and phages, which may promote the transmission of antibiotic resistance and facilitate emergence of pathobionts and pathogens with enhanced virulence. The targeted manipulation of the microbiota and vaccination might offer strategies to prevent this evolution. As gut luminal microbes impact various aspects of the host's physiology, improved strategies for preventing enteropathogen infection and disease-inflicted DNA exchange may be of broad interest well beyond the acute infection.

4. Characterization of Resistance Genes and Plasmids from Outbreaks and Illness Clusters Caused by Salmonella Resistant to Ceftriaxone in the United States, 2011-2012.

Author(s): Folster, Jason P; Grass, Julian E; Bicknese, Amelia; Taylor, Julia; Friedman, Cindy R; Whichard, Jean M

Source: Microbial drug resistance (Larchmont, N.Y.); Mar 2017; vol. 23 (no. 2); p. 188-193

Publication Date: Mar 2017

Publication Type(s): Journal Article

PubMedID: 27828730

Abstract: Salmonella is an important cause of foodborne illness; however, quickly identifying the source of these infections can be difficult, and source identification is a crucial step in preventing additional illnesses. Although most infections are self-limited, invasive salmonellosis may require antimicrobial treatment. Ceftriaxone, an extended-spectrum cephalosporin, is commonly used for treatment of salmonellosis. Previous studies have identified a correlation between the food animal/retail meat source of ceftriaxone-resistant Salmonella and the type of resistance gene and plasmid it carries. In this study, we examined seven outbreaks of ceftriaxone-resistant Salmonella infections, caused by serotypes Typhimurium, Newport, Heidelberg, and Infantis. All isolates were positive for a plasmid-encoded blaCMY gene. Plasmid incompatibility typing identified five IncI1 and two IncA/C plasmids. Both outbreaks containing blaCMY-IncA/C plasmids were linked to consumption of cattle products. Three of five outbreaks with blaCMY-IncI1 (ST12) plasmids were linked to a poultry source. The remaining IncI1 outbreaks were associated with ground beef (ST20)

and tomatoes (ST12). In addition, we examined isolates from five unsolved clusters of ceftriaxone-resistant Salmonella infections and used our plasmid-encoded gene findings to predict the source. Overall, we identified a likely association between the source of ceftriaxone-resistant Salmonella outbreaks and the type of resistance gene/plasmid it carries.

5. Multinational outbreak of travel-related Salmonella Chester infections in Europe, summers 2014 and 2015.

Author(s): Fonteneau, Laure; Jourdan Da Silva, Nathalie; Fabre, Laetitia; Ashton, Philip; Torpdahl, Mia; Müller, Luise; Bouchrif, Brahim; El Boulani, Abdellah; Valkanou, Eleni; Mattheus, Wesley; Friesema, Ingrid; Herrera Leon, Silvia; Varela Martínez, Carmen; Mossong, Joël; Severi, Ettore; Grant, Kathie; Weill, François-Xavier; Gossner, Céline M; Bertrand, Sophie; Dallman, Tim; Le Hello, Simon

Source: Euro surveillance : bulletin Europeen sur les maladies transmissibles = European communicable disease bulletin; Feb 2017; vol. 22 (no. 7)

Publication Date: Feb 2017

Publication Type(s): Journal Article

PubMedID: 28230522

Available in full text at Euro surveillance: bulletin Europeen sur les maladies transmissibles = European communicable disease bulletin [Euro Surveill] NLMUID: 100887452 - from EBSCOhost

Abstract: Between 2014 and 2015, the European Centre for Disease Prevention and Control was informed of an increase in numbers of Salmonella enterica serotype Chester cases with travel to Morocco occurring in six European countries. Epidemiological and microbiological investigations were conducted. In addition to gathering information on the characteristics of cases from the different countries in 2014, the epidemiological investigation comprised a matched case-case study involving French patients with salmonellosis who travelled to Morocco that year. A univariate conditional logistic regression was performed to quantify associations. The microbiological study included a whole genome sequencing (WGS) analysis of clinical and non-human isolates of S. Chester of varied place and year of isolation. A total of 162 cases, mostly from France, followed by Belgium, the Netherlands, Spain, Denmark and Sweden were reported, including 86 (53%) women. The median age per country ranged from 3 to 38 years. Cases of S. Chester were more likely to have eaten in a restaurant and visited the coast of Morocco. The results of WGS showed five multilocus sequence types (ST), with 96 of 153 isolates analysed clustering into a tight group that corresponded to a novel ST, ST1954. Of these 96 isolates, 46 (48%) were derived from food or patients returning from Morocco and carried two types of plasmids containing either qnrS1 or qnrB19 genes. This European-wide outbreak associated with travel to Morocco was likely a multi-source outbreak with several food vehicles contaminated by multidrug-resistant S. Chester strains.

6. Factors Associated with Sequelae of Campylobacter and Non-typhoidal Salmonella Infections: A Systematic Review.

Author(s): Esan, Oluwaseun B; Pearce, Madison; van Hecke, Oliver; Roberts, Nia; Collins, Dylan R J; Violato, Mara; McCarthy, Noel; Perera, Rafael; Fanshawe, Thomas R

Source: EBioMedicine; Feb 2017; vol. 15 ; p. 100-111

Publication Date: Feb 2017

Publication Type(s): Meta-analysis Journal Article Review

PubMedID: 27965105

Abstract: Despite the significant global burden of gastroenteritis and resulting sequelae, there is limited evidence on risk factors for sequelae development. We updated and extended previous systematic reviews by assessing the role of antibiotics, proton pump inhibitors (PPI) and symptom severity in the development of sequelae following campylobacteriosis and salmonellosis. We searched four databases, including PubMed, from 1 January 2011 to 29 April 2016. Observational studies reporting sequelae of reactive arthritis (ReA), Reiter's syndrome (RS), irritable bowel syndrome (IBS) and Guillain-Barré syndrome (GBS) following gastroenteritis were included. The primary outcome was incidence of sequelae of interest amongst cases of campylobacteriosis and salmonellosis. A narrative synthesis was conducted where heterogeneity was high. Of the 55 articles included, incidence of ReA (n=37), RS (n=5), IBS (n=12) and GBS (n=9) were reported following campylobacteriosis and salmonellosis. A pooled summary for each sequela was not estimated due to high level of heterogeneity across studies (I2>90%). PPI usage and symptoms were sparsely reported. Three out of seven studies found a statistically significant association between antibiotics usage and development of ReA. Additional primary studies investigating risk modifying factors in sequelae of GI infections are required to enable targeted interventions.

7. Factors Influencing Knowledge, Food Safety Practices and Food Preferences During Warm Weather of Salmonella and Campylobacter Cases in South Australia.

Author(s): Milazzo, Adriana; Giles, Lynne C; Zhang, Ying; Koehler, Ann P; Hiller, Janet E; Bi, Peng

Source: Foodborne pathogens and disease; Jan 2017

Publication Date: Jan 2017

Publication Type(s): Journal Article

PubMedID: 28045552

Abstract:OBJECTIVETo assess food safety practices, food shopping preferences, and eating behaviors of people diagnosed with Salmonella or Campylobacter infection in the warm seasons, and to identify socioeconomic factors associated with behavior and practices.METHODSA cross-sectional survey was conducted among Salmonella and Campylobacter cases with onset of illness from January 1 to March 31, 2013. Multivariable logistic regression analyses examined relationships between socioeconomic position and food safety knowledge and practices, shopping and food preferences, and preferences, perceptions, and knowledge about food safety information on warm days.RESULTSRespondents in our study engaged in unsafe personal and food hygiene practices. They also carried out unsafe food preparation practices, and had poor knowledge of foods associated with an increased risk of foodborne illness. Socioeconomic position did not influence food safety practices. We found that people's reported eating behaviors and food preferences were influenced by warm weather.CONCLUSIONSOur study has explored preferences and practices related to food safety in the warm season months. This is important given that warmer ambient temperatures are projected to rise, both globally and in Australia, and will have a substantial effect on the burden of infectious gastroenteritis including foodborne disease. Our results provide information about modifiable behaviors for the prevention of foodborne illness in the household in the warm weather and the need for information to be disseminated across the general population. An understanding of the knowledge and factors associated with human behavior during warmer weather is critical for public health interventions on foodborne prevention.

8. Nano-materials for use in sensing of salmonella infections: Recent advances.

Author(s): Pashazadeh, Paria; Mokhtarzadeh, Ahad; Hasanzadeh, Mohammad; Hejazi, Maryam; Hashemi, Maryam; de la Guardia, Miguel

Source: Biosensors & bioelectronics; Jan 2017; vol. 87 ; p. 1050-1064

Publication Date: Jan 2017

Publication Type(s): Journal Article Review

PubMedID: 27728896

Abstract: Salmonella infectious diseases spreading every day through food have become a life-threatening problem for millions of people and growing menace to society. Health expert's estimate that the yearly cost of all the food borne diseases is approximately $5-6 billion. Traditional methodologies for salmonella analysis provide high reliability and very low limits of detection. Among them immunoassays and Nucleic acid-based assays provide results within 24h, but they are expensive, tedious and time consuming. So, there is an urgent need for development of rapid, robust and cost-effective alternative technologies for real-time monitoring of salmonella. Several biosensors have been designed and commercialized for detection of this pathogen in food and water. In this overview, we have updated the literature concerning novel biosensing methods such as various optical and electrochemical biosensors and newly developed nano- and micro-scaled and aptamers based biosensors for detection of salmonella pathogen. Furthermore, attention has been focused on the principal concepts, applications, and examples that have been achieved up to diagnose salmonella. In addition, commercial biosensors and foreseeable future trends for onsite detecting salmonella have been summarized.

Campylobacter

1. The consequences of campylobacter infection

Author(s): O'Brien S.J.

Source: Current Opinion in Gastroenterology; 2017; vol. 33 (no. 1); p. 14-20

Publication Date: 2017

Publication Type(s): Review

Abstract: Purpose of review: The purpose of this review is to provide an update on the clinical, public health and economic consequences of Campylobacter infection. Recent findings: Campylobacter is a leading bacterial cause of food-related illness. Its importance is enhanced by the chronic sequelae that can result from acute infection. Recent advances include a new clinical classification system for neurological sequelae with the aim of speeding accurate diagnosis and appropriate treatment, a better understanding of the mechanisms underlying postinfectious functional gastrointestinal disorders, the emergence of Campylobacter concisus and Campylobacter showae as potential aetiological agents in inflammatory bowel disease, a new mechanism for antimicrobial resistance in campylobacters and a better appreciation of the economic costs. Summary: Campylobacter infection is very common and can lead to serious chronic sequelae and considerable personal, healthcare and societal costs.

2. Whole-genome sequencing in epidemiology of Campylobacter jejuni infections

Author(s): Llarena A.-K.; Rossi M.; Taboada E.

Source: Journal of Clinical Microbiology; May 2017; vol. 55 (no. 5); p. 1269-1275

Publication Date: May 2017

Publication Type(s): Review

Available in full text at Journal of Clinical Microbiology - from National Library of Medicine

Abstract: This review describes the current state of knowledge regarding the application of whole-genome sequencing (WGS) in the epidemiology of Campylobacter jejuni, the leading cause of

bacterial gastroenteritis worldwide. We describe how WGS has increased our understanding of the evolutionary and epidemiological dynamics of this pathogen and how WGS has the potential to improve surveillance and outbreak detection. We have identified hurdles to the full implementation of WGS in public health settings. Despite these challenges, we think that ample evidence is available to support the benefits of integrating WGS into the routine monitoring of C. jejuni infections and outbreak investigations.Copyright © 2017 American Society for Microbiology. All Rights Reserved.

3. Towards understanding clinical campylobacter infection and its transmission: time for a different approach?

Author(s): Casey E.; Fitzgerald E.; Lucey B.

Source: British Journal of Biomedical Science; Apr 2017; vol. 74 (no. 2); p. 53-64

Publication Date: Apr 2017

Publication Type(s): Review

Abstract: Campylobacter spp. are among the most commonly diagnosed causes of human infection. Methods for detection of the 29 campylobacter species have mainly focused on cultivation of the thermophilic species. More than 99% of clinical campylobacter isolates notified in the UK in the recent past have been from faecal samples and associated with gastroenteritis. Campylobacter enteritis notifications in temperate zones show a seasonal increase during the summer months with a sharp decrease in the winter months, a pattern which remains incompletely understood. The striking seasonality in the expression of many human genes, some concerned with inflammation and immunity, suggests a need for further study of the host regarding the temporal distribution of many human infections, including campylobacteriosis. A tendency for campylobacter to enter a non-cultivable state under adverse conditions effects a reduction in the number of isolations. A Polymerase Chain Reaction (PCR)-based screening approach for the presence of the Campylobacter genus and followed by speciation has provided some insight into the limitations of cultivation for campylobacter, also allowing the discovery of new species. The increased sensitivity of the PCR-based approach over culture-based methods may make it difficult for the laboratory to differentiate asymptomatic campylobacter carriage from clinical campylobacter infection in non-sterile body sites. Campylobacter infection depends on a combination of host factors, and on acquisition of a suitably virulent strain with a tropism for human epithelium. The possibility of persistence of campylobacter in a viable but non-culturable latent form in the human body may also require further investigation. The scope of this review includes a discussion of current methods for diagnosing acute campylobacter infection and for detecting campylobacter in water and foodstuffs. The review also questions the prevailing view that poultry is the most common source of campylobacteriosis.

4. The campylobacteriosis conundrum - examining the incidence of infection with Campylobacter sp. in Australia, 1998-2013.

Author(s): Moffatt, C R M; Glass, K; Stafford, R; D'Este, C; Kirk, M D

Source: Epidemiology and infection; Mar 2017; vol. 145 (no. 4); p. 839-847

Publication Date: Mar 2017

Publication Type(s): Journal Article

PubMedID: 27938447

Available in full text at Epidemiology and Infection - from ProQuest

Abstract: Campylobacter sp. are a globally significant cause of gastroenteritis. Although rates of infection in Australia are among the highest in the industrialized world, studies describing

campylobacteriosis incidence in Australia are lacking. Using national disease notification data between 1998 and 2013 we examined Campylobacter infections by gender, age group, season and state and territory. Negative binomial regression was used to estimate incidence rate ratios (IRRs), including trends by age group over time, with post-estimation commands used to obtain adjusted incidence rates. The incidence rate for males was significantly higher than for females [IRR 1·20, 95% confidence interval (CI) 1·18-1·21], while a distinct seasonality was demonstrated with higher rates in both spring (IRR 1·18, 95% CI 1·16-1·20) and summer (IRR 1·17, 95% CI 1·16-1·19). Examination of trends in age-specific incidence over time showed declines in incidence in those aged <40 years combined with contemporaneous increases in older age groups, notably those aged 70-79 years (IRR 1998-2013: 1·75, 95% CI 1·63-1·88). While crude rates continue to be highest in children, our findings suggest the age structure for campylobacteriosis in Australia is changing, carrying significant public health implications for older Australians.

5. Factors Associated with Sequelae of Campylobacter and Non-typhoidal Salmonella Infections: A Systematic Review.

Author(s): Esan, Oluwaseun B; Pearce, Madison; van Hecke, Oliver; Roberts, Nia; Collins, Dylan R J; Violato, Mara; McCarthy, Noel; Perera, Rafael; Fanshawe, Thomas R

Source: EBioMedicine; Feb 2017; vol. 15 ; p. 100-111

Publication Date: Feb 2017

Publication Type(s): Meta-analysis Journal Article Review

PubMedID: 27965105

Abstract: Despite the significant global burden of gastroenteritis and resulting sequelae, there is limited evidence on risk factors for sequelae development. We updated and extended previous systematic reviews by assessing the role of antibiotics, proton pump inhibitors (PPI) and symptom severity in the development of sequelae following campylobacteriosis and salmonellosis. We searched four databases, including PubMed, from 1 January 2011 to 29 April 2016. Observational studies reporting sequelae of reactive arthritis (ReA), Reiter's syndrome (RS), irritable bowel syndrome (IBS) and Guillain-Barré syndrome (GBS) following gastroenteritis were included. The primary outcome was incidence of sequelae of interest amongst cases of campylobacteriosis and salmonellosis. A narrative synthesis was conducted where heterogeneity was high. Of the 55 articles included, incidence of ReA (n=37), RS (n=5), IBS (n=12) and GBS (n=9) were reported following campylobacteriosis and salmonellosis. A pooled summary for each sequela was not estimated due to high level of heterogeneity across studies (I2>90%). PPI usage and symptoms were sparsely reported. Three out of seven studies found a statistically significant association between antibiotics usage and development of ReA. Additional primary studies investigating risk modifying factors in sequelae of GI infections are required to enable targeted interventions.

6. Dual role of Helicobacter and Campylobacter species in IBD: A systematic review and meta-analysis

Author(s): Castano-Rodriguez N.; Kaakoush N.O.; Mitchell H.M.; Lee W.S.

Source: Gut; Feb 2017; vol. 66 (no. 2); p. 235-249

Publication Date: Feb 2017

Publication Type(s): Article

Available in full text at Gut - from Highwire Press

Abstract: Objective To conduct a comprehensive global systematic review and meta-analysis on the association between Helicobacter pylori infection and IBD. As bacterial antigen cross-reactivity has been postulated to be involved in this association, published data on enterohepatic Helicobacter spp (EHS) and Campylobacter spp and IBD was also analysed. Design Electronic databases were searched up to July 2015 for all case-control studies on H. pylori infection/EHS/Campylobacter spp and IBD. Pooled ORs (P-OR) and 95% CIs were obtained using the random effects model. Heterogeneity, sensitivity and stratified analyses were performed. Results Analyses comprising patients with Crohn's disease (CD), UC and IBD unclassified (IBDU), showed a consistent negative association between gastric H. pylori infection and IBD (P-OR: 0.43, p value<1e-10). This association appears to be stronger in patients with CD (P-OR: 0.38, p value <1e-10) and IBDU (P-OR: 0.43, p value=0.008) than UC (P-OR: 0.53, p value <1e-10). Stratification by age, ethnicity and medications showed significant results. In contrast to gastric H. pylori, non H. pylori-EHS (P-OR: 2.62, p value=0.001) and Campylobacter spp, in particular C. concisus (P-OR: 3.76, p value=0.006) and C. showae (P-OR: 2.39, p value=0.027), increase IBD risk. Conclusions H. pylori infection is negatively associated with IBD regardless of ethnicity, age, H. pylori detection methods and previous use of aminosalicylates and corticosteroids. Antibiotics influenced the magnitude of this association. Closely related bacteria including EHS and Campylobacter spp increase the risk of IBD. These results infer that H. pylori might exert an immunomodulatory effect in IBD.

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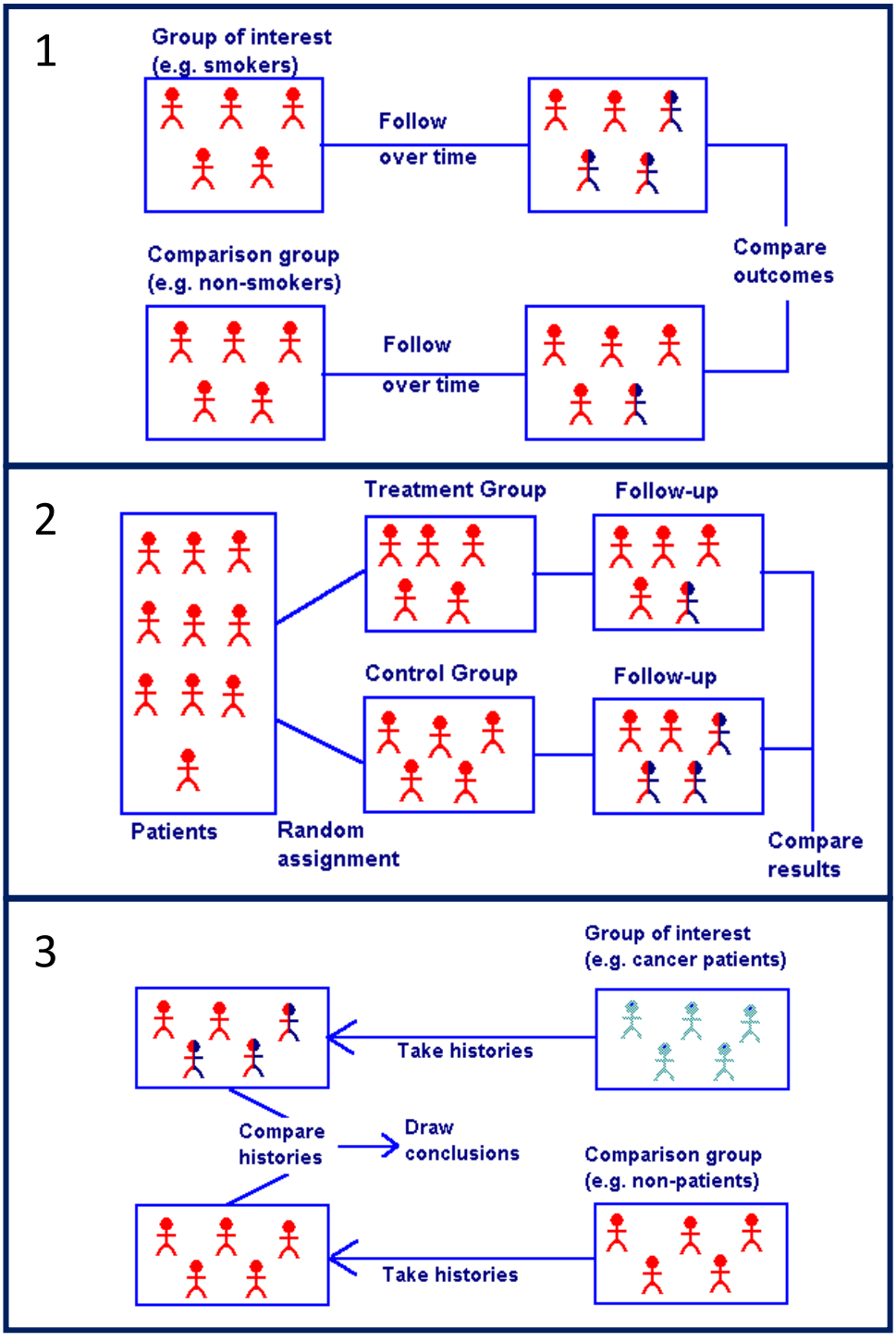
Exercise: Research Designs

Match the diagrams to the corresponding research designs.



A: Randomised Controlled Trial
B: Cohort Study
C: Case-control Study

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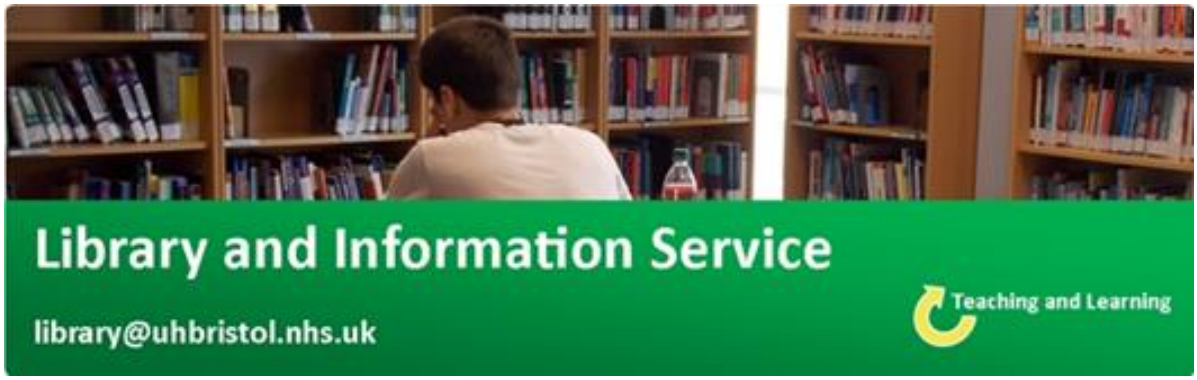
Answers: 1B; 2A; 3C



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