**Bacterial Keratitis in Toronto: A 16-Year Review of the Microorganisms Isolated and the Resistance Patterns Observed.**

### Abstract

#### PURPOSE:

To review the incidence, distribution, current trends, and resistance patterns of bacterial keratitis isolates in Toronto over the past 16 years.

#### METHODS:

Microbiology records of suspected bacterial keratitis that underwent a diagnostic corneal scraping and cultures from January 1, 2000, through December 31, 2015, were retrospectively reviewed. The distribution of the main isolated pathogens and in vitro laboratory minimum inhibitory concentration testing results were used to identify resistance patterns.

#### RESULTS:

A total of 2330 corneal scrapings were taken over 16 years. A pathogen was recovered in 1335 samples (57.3%), with bacterial keratitis accounting for 1189 of the positive cultures (86.0% of all isolates). The total number of gram-positive and gram-negative isolates was 963 and 324, respectively. Coagulase-negative Staphylococcus and Pseudomonas aeruginosa were the most common gram-positive and gram-negative bacteria isolates, respectively. A decreasing trend in the number of isolates in gram-positive bacteria (P = 0.01), specifically among Staphylococcus aureus (P < 0.0001) and Streptococcus species (P = 0.005), was identified. When analyzing the susceptibilities of gram-positive and gram-negative isolates, an increasing trend in antibiotic resistance was observed in erythromycin (P = 0.018), ceftazidime (P = 0.046), and piperacillin/tazobactam (P = 0.005). The susceptibility of tested gram-positive microorganisms to vancomycin was 99.6%.

#### CONCLUSIONS:

There has been a decreasing trend in the number of isolates in gram-positive microorganisms over the past 16 years. An increasing trend in resistance for various antibiotics against gram-negative and gram-positive isolates was identified. High susceptibility to vancomycin reinforced the empirical use of fortified tobramycin and vancomycin in the initial management of severe bacterial keratitis.

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# Interventions for treating genital Chlamydia trachomatis infection in pregnancy.

### Abstract

#### BACKGROUND:

Genital Chlamydia trachomatis (C.trachomatis) infection may lead to pregnancy complications such as miscarriage, preterm labour, low birthweight, preterm rupture of membranes, increased perinatal mortality, postpartum endometritis, chlamydial conjunctivitis and C.trachomatis pneumonia.This review supersedes a previous review on this topic.

#### OBJECTIVES:

To establish the most efficacious and best-tolerated therapy for treatment of genital chlamydial infection in preventing maternal infection and adverse neonatal outcomes.

#### SEARCH METHODS:

We searched the Cochrane Pregnancy and Childbirth Group's Trials Register, ClinicalTrials.gov, the WHO International Clinical Trials Registry Platform (ICTRP) (26 June 2017) and reference lists of retrieved studies.

#### SELECTION CRITERIA:

Randomised controlled trials (RCTs) as well as studies published in abstract form assessing interventions for treating genital C.trachomatis infection in pregnancy. Cluster-RCTs were also eligible for inclusion but none were identified. Quasi-randomised trials and trials using cross-over design are not eligible for inclusion in this review.

#### DATA COLLECTION AND ANALYSIS:

Two review authors independently assessed studies for inclusion, assessed trial quality and extracted the data using the agreed form. Data were checked for accuracy. Evidence was assessed using the GRADE approach.

#### MAIN RESULTS:

We included 15 trials (involving 1754 women) although our meta-analyses were based on fewer numbers of studies/women. All of the included studies were undertaken in North America from 1982 to 2001. Two studies were low risk of bias in all domains, all other studies had varying risk of bias. Four other studies were excluded and one study is ongoing.Eight comparisons were included in this review; three compared antibiotic (erythromycin, clindamycin, amoxicillin) versus placebo; five compared an antibiotic versus another antibiotic (erythromycin, clindamycin, amoxicillin, azithromycin). No study reported different antibiotic regimens. Microbiological cure (primary outcome) Antibiotics versus placebo: Erythromycin (average risk ratio (RR) 2.64, 95% confidence interval (CI) 1.60 to 4.38; two trials, 495 women; I2 = 68%; moderate-certainty evidence), and clindamycin (RR 4.08, 95% CI 2.35 to 7.08; one trial, 85 women;low-certainty evidence) were associated with improved microbiological cure compared to a placebo control. In one very small trial comparing amoxicillin and placebo, the results were unclear, but the evidence was graded very low (RR 2.00, 95% CI 0.59 to 6.79; 15 women). One antibiotic versus another antibiotic: Amoxicillin made little or no difference in microbiological cure in comparison to erythromycin (RR 0.97, 95% CI 0.93 to 1.01; four trials, 466 women; high-certainty evidence), probably no difference compared to clindamycin (RR 0.96, 95% CI 0.89 to 1.04; one trial, 101 women; moderate-quality evidence), and evidence is very low certainty when compared to azithromycin so the effect is not certain (RR 0.89, 95% CI 0.71 to 1.12; two trials, 144 women; very low-certainty evidence). Azithromycin versus erythromycin (average RR 1.11, 95% CI 1.00 to 1.23; six trials, 374 women; I2 = 53%; moderate-certainty evidence) probably have similar efficacy though results appear to favour azithromycin. Clindamycin versus erythromycin (RR 1.06, 95% CI 0.97 to 1.15; two trials, 173 women; low-certainty evidence) may have similar numbers of women with a microbiological cure between groups.Evidence was downgraded for design limitations, inconsistency, and imprecision in effect estimates. Side effects of the treatment (maternal) (secondary outcome) Antibiotics versus placebo: side effects including nausea, vomiting, and abdominal pain, were reported in two studies (495 women) but there was no clear evidence whether erythromycin was associated with more side effects than placebo and a high level of heterogeneity (I2 = 78%) was observed (average RR 2.93, 95% CI 0.36 to 23.76). There was no clear difference in the number of women experiencing side effects when clindamycin was compared to placebo in one small study (5/41 versus 1/44) (RR 6.35, 95% CI 0.38 to 107.45, 62 women). The side effects reported were mostly gastrointestinal and also included resolving skin rashes. One antibiotic versus another antibiotic: There was no clear difference in incidence of side effects (including nausea, vomiting, diarrhoea and abdominal pain) when amoxicillin was compared to azithromycin based on data from one small study (36 women) (RR 0.56, 95% CI 0.24 to 1.31).However, amoxicillin was associated with fewer side effects compared to erythromycin with data from four trials (513 women) (RR 0.31, 95% CI 0.21 to 0.46; I2 = 27%). Side effects included nausea, vomiting, diarrhoea, abdominal cramping, rash, and allergic reaction.Both azithromycin (RR 0.24, 95% CI 0.17 to 0.34; six trials, 374 women) and clindamycin (RR 0.44, 95% CI 0.22 to 0.87; two trials, 183 women) were associated with a lower incidence of side effects compared to erythromycin. These side effects included nausea, vomiting, diarrhoea and abdominal cramping.One small study (101 women) reported there was no clear difference in the number of women with side effects when amoxicillin was compared with clindamycin (RR 0.57, 95% CI 0.14 to 2.26; 107 women). The side effects reported included rash and gastrointestinal complaints. Other secondary outcomes Single trials reported data on repeated infections, preterm birth, preterm rupture of membranes, perinatal mortality and low birthweight and found no clear differences between treatments.Many of this review's secondary outcomes were not reported in the included studies.

#### AUTHORS' CONCLUSIONS:

Treatment with antibacterial agents achieves microbiological cure from C.trachomatis infection during pregnancy. There was no apparent difference between assessed agents (amoxicillin, erythromycin, clindamycin, azithromycin) in terms of efficacy (microbiological cure and repeat infection) and pregnancy complications (preterm birth, preterm rupture of membranes, low birthweight). Azithromycin and clindamycin appear to result in fewer side effects than erythromycin.All of the studies in this review were conducted in North America, which may limit the generalisability of the results. In addition, study populations may differ in low-resource settings and these results are therefore only applicable to well-resourced settings. Furthermore, the trials in this review mainly took place in the nineties and early 2000's and antibiotic resistance may have changed since then.Further well-designed studies, with appropriate sample sizes and set in a variety of settings, are required to further evaluate interventions for treating C.trachomatis infection in pregnancy and determine which agents achieve the best microbiological cure with the least side effects. Such studies could report on the outcomes listed in this review.

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# [Analysis of characteristics of bacteria in respiratory tract infection in 2013-2016 in Heibei 3A hospital: a single-center report of 7 497 patients].

### Abstract

#### OBJECTIVE:

To analyze the changes and characteristics of respiratory tract bacteria in Hebei 3A Hospital, and to provide new rationale for clinical diagnosis and treatment.

#### METHODS:

A single-center retrospective analysis was conducted. 7 497 patients with respiratory tract infection admitted to Hebei Chest Hospital from January 2013 to December 2016 were enrolled. Deep sputum was collected, and the bacterial cultures and susceptibility analysis was conducted in sputum and upper respiratory secretions were collected by fiberoptic bronchoscopy.

#### RESULTS:

A total of 7 497 patients with respiratory tract infection were enrolled in the study, and 11 909 strains of 13 kinds of dominant pathogens were isolated. The dominant pathogens for respiratory tract infection were Monilia albican (23.7%), Klebsiella pneumoniae (12.9%), Pseudomonas aeruginosa (11.6%), Escherichia coli (9.5%), Candida glabrata (9.1%), Acinetobacter baumanii (7.9%), Aspergillus (6.7%), Stenotrophomonas maltophilia (4.5%), coagulase negative Staphylococcus (3.7%) and some species of Pseudomonas (3.7%), Staphylococcus aureus (3.0%), Aerobacter cloacae (1.9%), and Candida tropicalis (1.8%). A total of 6 198 strains of 7 kinds of Gram negative (G-) bacilli infection dominant pathogens accounts for 52.0% of all infections, Klebsiella pneumonia (24.8%), Pseudomonas aeruginosa (22.3%), Escherichia coli (18.2%) and Acinetobacter baumanii (15.3%) were the main pathogens, and increased year by year. Susceptibility analysis showed that the preferred antibiotics for G- bacteria were carbapenems, followed by risperidone, sulbactam, cefepime, amikacin, and the third generation of cephalosporins. A total of 798 strains of 2 kinds of Gram positive (G+) bacilli infection dominant pathogens accounted for 6.7% of all infections, were coagulase negative Staphylococcus (54.8%) and Staphylococcus aureus (45.2%), each had changed little by year. Susceptibility analysis showed that G+ bacteria were sensitive to glycopeptides, followed by cefoxitin, cotrimoxazole, the tetracyclines, quinolones, azithromycin, erythromycin and so on. The advantages of 4 species of fungi were 4 913 strains, accounted for all of the 41.3% strains, with 57.5% of Candida albicans, and the trend was increasing year by year. Susceptibility analysis results showed that the antifungal susceptibility of dominant fungi were higher.

#### CONCLUSIONS:

G- bacilli is still the main source of infection, and showed an upward trend year by year. Fungal infection rate cannot be ignored, and we must pay attention to fungal infection incentives. We should strengthen the rational use of antibiotics.

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