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Abstract: Although community-onset bloodstream infection (BSI) is recognized to be a major cause of morbidity and mortality, there is a paucity of population-based studies defining its overall burden. We conducted population-based laboratory surveillance for all community-onset BSI in the Calgary Health Region during 2000-2004. A total of 4467 episodes of community-onset BSI were identified for an overall annual incidence of 81.6/100,000. The three species, Escherichia coli, Staphylococcus aureus, and Streptococcus pneumoniae were responsible for the majority of community-onset BSI; they occurred at annual rates of 25.8, 13.5, and 10.1/100,000, respectively. Overall 3445/4467 (77%) episodes resulted in hospital admission representing 0.7% of all admissions to major acute care hospitals. The subsequent hospital length of stay was a median of 9 (interquartile range, 5-15) days; the total days of acute hospitalization attributable to community-onset BSI was 51,146 days or 934 days/100,000 annually. Four hundred and sixty patients died in hospital for a case-fatality rate of 13%. Community-onset BSI is common and has a major patient and societal impact. These data support further efforts to reduce the burden of community-onset BSI.
Community-onset urinary tract infections: a population-based assessment.

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Abstract:
Although multiple studies have investigated community-onset urinary tract infections (UTI), population-based data are lacking. We therefore conducted population-based laboratory surveillance in order to define the incidence, demographic risk factors, etiology, and antimicrobial susceptibilities of community onset UTI in a large Canadian region.

Laboratory surveillance for all community onset UTIs among residents of the Calgary Health Region (population approximately 1.2 million) was conducted during 2004/2005. Repeated positive samples within a 1-month period and those infections first cultured more than 2 days after admission to a hospital were excluded.

A total of 40,618 episodes of community onset UTI occurred among 30,851 residents for an overall annual incidence of 17.5 per 1,000. Seventy-four percent of the cultures were submitted from ambulatory patients, 18% from hospitalized patients within the first 2 days of admission, and 9% from nursing home residents. Females were at significantly increased risk as compared to males (30.0 vs 5.0 per 1,000, RR 5.98; 95% CI, 5.81-6.15; p...
Cost of intensive care unit-acquired bloodstream infections.

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Cost of Illness
Cross Infection - economics - mortality
Female
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Hospital Mortality
Humans
Intensive Care Units - economics
Length of Stay
Male
Matched-Pair Analysis
Middle Aged
Sepsis - economics - mortality

Abstract:
Intensive care unit-acquired (ICU-acquired) bloodstream infections (BSI) are an important complication of critical illness. The objective of this study was to quantify the excess length of stay, mortality and cost attributable to ICU-acquired BSI. A matched cohort study was conducted in all adult ICUs in the Calgary Health Region between 1 May 2000 and 30 April 2003. One hundred and forty-four patients with ICU-acquired BSI were matched (1:1) to patients without ICU-acquired BSI. Patients with ICU-acquired BSI had a significantly increased median length of ICU stay (15.5 [interquartile range (IQR) 8-26] days vs 12 [IQR 7-18.5] days, P=0.003) and median costs of hospital care (85,137 dollars [IQR 45,740-131,412 dollars] vs 67,879 dollars [IQR 35,043-115,915 dollars, P=0.02) compared with patients without ICU-acquired BSI. The median excess length of ICU stay was two days and the median cost attributable to ICU-acquired BSI was 12,321 dollars per case. Sixty (42%) of the cases died compared with 37 (26%) of the controls [P=0.002, attributable mortality 16%, 95% confidence interval (CI) 5.9-26.0%]. Patients with ICU-acquired BSI were at increased risk for in-hospital death (odds ratio=2.64, 95%CI 1.40-5.29). Among survivor-matched pairs, the median excess lengths of ICU and hospital stay attributable to development of ICU-acquired BSI were two and 13.5 days, respectively, and the attributable cost due to ICU-acquired BSI was 25,155 dollars per case survivor. Critically ill patients who develop ICU-acquired BSI suffer excess morbidity and mortality, and incur significantly increased healthcare costs. These data support expenditures on infection prevention and control programmes and further research into reducing the impact of these infections.

PubMed ID: 16621137 View in PubMed
Epidemiology of Clostridium species bacteremia in Calgary, Canada, 2000-2006.

https://arctichealth.org/en/permalink/ahliterature155884

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          Bacteremia - epidemiology - microbiology - mortality
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          Clostridium - classification - isolation & purification
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          Community-Acquired Infections - epidemiology - microbiology
          Cross Infection - epidemiology - microbiology
          Female
          Humans
          Incidence
          Length of Stay
          Male
          Middle Aged
          Neoplasms - complications
          Penicillin resistance
          Renal Dialysis - adverse effects
          Risk factors
          Treatment Outcome
Abstract: To define the incidence, risk factors for acquisition, and outcomes associated with clostridial bacteremia in a large Canadian health region.

Retrospective population-based surveillance for clostridial bacteremia was conducted among all residents of the Calgary Health Region (population 1.2 million) during 2000-2006.

One hundred and thirty-eight residents had incident Clostridium species bacteremia (1.8 per 100,000/year); 45 (33%) were nosocomial, 55 (40%) were healthcare-associated community onset, and 38 (28%) were community acquired. Older age and a number of underlying conditions were risk factors for acquiring Clostridium species bacteremia most importantly hemodialysis [relative risk (RR) 212.3; 95% confidence interval (CI) 106.5-385.5], malignancy (RR 40.2; 95% CI 27.6-58.1), and Crohn's disease (RR 11.2; 95% CI 3.0-29.4). Clostridium perfringens was most commonly identified with 58 (42%) isolates followed by Clostridium septicum (19; 14%), Clostridium ramosum (13; 9%), Clostridium clostridiiforme (8; 6%), and Clostridium difficile (7; 5%). Reduced susceptibility to penicillin occurred in 14/135 (10%), to metronidazole in 2/135 (1%), and to clindamycin in 36/135 (27%) isolates. The median length of stay was 12.7 days and 39/130 (30%) patients died in hospital for mortality rate of 0.5 per 100,000/year.

Clostridium species bacteremia is associated with a significant burden of illness and hemodialysis and cancer patients are at highest risk.

PubMed ID: 18672296 View in PubMed
The purpose of the study was to determine the incidence and risk factors for the acquisition of methicillin-resistant Staphylococcus aureus (MRSA) in our community. This study used a cross-sectional design to assess patients colonized or infected with MRSA. The study population consisted of residents of London, Ontario, Canada, who were identified as MRSA-positive for the first time in 1997. All acute- and chronic-care hospitals, long-term healthcare facilities, and community physicians' offices in the city of London participated in the study.

Incidence of MRSA in the community, risk factors for acquisition, especially previous hospitalization over a defined period, and strain type were evaluated.

In 1997, 331 residents of London were newly identified as MRSA-positive, representing an annual incidence of 100/100,000 persons (95% confidence interval, 88.8-110.7). Thirty-one (9.4%) individuals were not healthcare-facility patients in the previous month, and 11 (3.3%), 10 (3.0%), and 6 (1.8%) individuals had no such contact in the previous 3, 6, and 12 months, respectively. One hundred seventy-seven strains, including five of the isolates from patients with no healthcare-facility contact in the previous year, were typed. One hundred sixty (90.3%) of these isolates, including all typed strains from patients with no healthcare facility contact, belonged to a single clone.

These findings demonstrate that the incidence of MRSA is higher than previously reported and that hospital contact is the single most important risk factor for the acquisition of MRSA in our community. Screening for MRSA in previously hospitalized patients at the time of hospitalization may reduce nosocomial spread and indirectly reduce the incidence of MRSA in the community.
Abstract: Although Escherichia coli is the most common cause of bloodstream infection, its epidemiology has not been well defined in non-selected populations. We sought to describe the incidence of risk factors for, and outcomes associated with, E. coli bacteraemia. Population-based surveillance for E. coli bacteraemia was conducted in the Calgary Health Region (population 1.2 million) during the period 2000-2006. In total, 2368 episodes of E. coli bacteraemia were identified for an overall annual population incidence of 30.3/100 000; 15% were nosocomial, 32% were healthcare-associated community-onset and 53% were community-acquired bacteraemias. The very young and the elderly were at highest risk for E. coli bacteraemia. Sixty per cent of the episodes occurred in females (relative risk 1.5; 95% CI 1.4-1.6). Dialysis, solid organ transplantation and neoplastic disease were the most important risk factors for acquiring E. coli bacteraemia. Rates of resistance to ampicillin, trimethoprim-sulphamethoxazole, gentamicin, ciprofloxacin, cefazolin and ceftriaxone increased significantly during the period 2000-2006. The case-fatality rate was 11% and the annual population mortality rate was 2.9/100 000. Increasing age, ciprofloxacin resistance, non-urinary focus and a number of comorbid illnesses were independently associated with an increased risk of death, and community acquisition and urinary focus were associated with a lower risk of death. This study documents the major burden of illness associated with E. coli bacteraemia and identifies groups at increased risk for acquiring and dying from these infections. The emergence of ciprofloxacin resistance and its adverse effect on patient outcome is a major concern.

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Abstract:
Bloodstream infection (BSI) is a serious complication of critical illness but it is uncertain whether acquisition of BSI in the intensive care unit (ICU) increases the risk of death. A study was conducted among all Calgary health region (population approximately 1 million) adults admitted to ICUs for 48 h or more during a three-year period to investigate the occurrence, microbiology and risk factors for developing an ICU-acquired BSI and to determine whether these infections independently predict mortality. One hundred and ninety-nine ICU-acquired BSI episodes occurred during 4933 ICU admissions for a cumulative incidence of 4% and an incidence density of 5.4 per 1000 ICU days. The most common isolates were Staphylococcus aureus (18%), coagulase-negative staphylococci (11%), and Enterococcus faecalis (8%); 12% of infections were due to antimicrobial-resistant bacteria. Admission to the regional neurosurgery/trauma ICU (odds ratio (OR) 2.86; 95% confidence interval (CI) 2.10-3.90) and increasing Acute Physiology and Chronic Health Evaluation II (APACHE II) score (OR 1.05 per point, 95% CI 1.03-1.07) were associated with higher risk, whereas a surgical diagnosis (OR 0.69; 95% CI 0.52-0.93) was associated with lower risk of developing ICU-acquired BSI in logistic regression analysis. The crude in-hospital death rate was 45% for patients with ICU-acquired BSI compared with 21% for those without (P

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Long-term mortality associated with community-onset bloodstream infection.
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Abstract: Although bloodstream infection is widely recognized as an important cause of acute morbidity and mortality, long-term mortality outcomes are less well defined. The objective of this study was to define the early (=28 days) and late (>28 days) mortality and assess determinants of late death following community-onset bloodstream infection.

All adult residents of the Calgary Zone who had community-onset bloodstream infections during the period 1 January 2003 and 31 December 2007 were included. The mortality outcome was assessed through to 31 December 2008.

A total of 4,553 cases were identified, of which 2,105 (46%) were healthcare-associated and 2,448 (54%) were community-acquired. The 28-day, 90-day, and 365-day all-cause case-fatality rates were 561/4,553 (12%), 780/4,553 (17%), and 1,131 (25%), respectively. Within the first 28 days, the median time to death was 4 (interquartile range [IQR] 1-12) days, with 158 (28%) and 212 (38%) of early (=28-day) deaths occurring by days 1 and 2, respectively. Among survivors to 28 days (n = 3,992), 570 (14%) suffered late 1-year mortality (i.e., death occurred between 29 and 365 days postinception). The most common causes of death in this cohort as listed by the vital statistics data were malignancy in 220 (39%), cardiovascular in 135 (24%), and infection-related in 37 (7%). Older age, higher Charlson score, prolonged initial admission duration, and healthcare-associated and polymicrobial infections were independently associated with late 1-year mortality.

Community-onset bloodstream infection is associated with major early and late mortality.
Abstract:
Anaerobes are a relatively uncommon but important cause of bloodstream infection. However, their epidemiology has not been well defined in non-selected populations. We sought to describe the incidence of, risk factors for, and outcomes associated with anaerobic bacteremia.

Population-based surveillance for bacteremia with anaerobic microorganisms was conducted in the Calgary area (population 1.2 million) during the period from 2000 to 2008. A total of 904 incident cases were identified, for an overall population incidence of 8.7 per 100,000 per year; 231 (26 %) were nosocomial, 300 (33 %) were healthcare-associated community-onset, and 373 (41 %) were community-acquired. Elderly males were at the greatest risk. The most common pathogens identified were: Bacteroides fragilis group (3.6 per 100,000), Clostridium (non-perfringens) spp. (1.1 per 100,000), Peptostreptococcus spp. (0.9 per 100,000), and Clostridium perfringens (0.7 per 100,000). Non-susceptibility to metronidazole was 2 %, to clindamycin 17 %, and to penicillin 42 %. Relative to the general population, risk factors for anaerobic bloodstream infection included: male sex, increasing age, a prior diagnosis of cancer, chronic liver disease, heart disease, diabetes mellitus, stroke, inflammatory bowel disease, human immunodeficiency virus (HIV) infection, chronic obstructive pulmonary disease (COPD), and/or hemodialysis-dependent chronic renal failure (HDCRF). The 30-day mortality was 20 %. Increasing age, nosocomial acquisition, presence of malignancy, and several other co-morbid illnesses were independently associated with an increased risk of death.

Anaerobic bloodstream infection is responsible for a significant burden of disease in general populations. The data herein establish the extent to which anaerobes contribute to morbidity and subsequent mortality. This information is key in developing preventative, empiric treatment and research priorities.
Population-based laboratory assessment of the burden of community-onset bloodstream infection in Victoria, Canada.

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         Hospitalization - statistics & numerical data
         Humans
         Incidence
         Infant
         Infant, Newborn
         Male
         Middle Aged
         Risk factors
         Sepsis - epidemiology - mortality
         Survival Analysis
         Young Adult

Abstract: Although community-onset bloodstream infection (BSI) is recognized as a major cause of morbidity and mortality, its epidemiology has not been well defined in non-selected populations. We conducted population-based laboratory surveillance in the Victoria area, Canada during 1998-2005 in order to determine the burden associated with community-onset BSI. A total of 2785 episodes were identified for an overall annual incidence of 101.2/100,000. Males and the very young and the elderly were at highest risk. Overall 1980 (71%) episodes resulted in hospital admission for a median length of stay of 8 days; the total days of acute hospitalization associated with community-onset BSI was 28,442 days or 1034 days/100,000 population per year. The in-hospital case-fatality rate was 13%. Community-onset BSI is associated with a major burden of illness. These data support ongoing and future preventative and research efforts aimed at reducing the major impact of these infections.

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