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# CHARACTERISTICS OF INVASIVE PNEUMOCOCCAL DIASEASE IN IMMUNOCOMPROMISED ADULTS AFTER PCV7 IMPLEMENTATION, TORONTO, CANADA, 2005-2011

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**Background:** Immunocompromised (IC) persons are at significantly higher risk of invasive pneumococcal disease (IPD) than others. Recently, the US and Canada have recommended PCV13 for IC adults. We reviewed population based surveillance data to describe the populations, features and outcomes of IPD in IC adults in the post-PCV7 era

**Methods:** From 2005-2013, TIBDN performed population-based surveillance for IPD in Toronto, Canada. Demographic and medical data are collected by chart review and patient and physican interview. Confirmation of SPN, serotyping are performed at a central laboratory. IC includes HIV, solid organ or bone marrow/stem cell transplantation, asplenia, sickle cell disease, SLE, hematologic malignancy, hepatic cirrhosis, chronic renal failure, or chronic receipt of immunosuppressive medications.

**Results:** Between 2005 and 2011, IC adults comprised 1032 (30%) of episodes of IPD in adults (>15yrs); 761 were IC due to an underlying chronic condition (+/- IC medication), and 271 due to IC medication (181 prednisone +/- other; 90 other). The most common IC conditions were: chronic renal failure (N=142), hepatic cirrhosis (141), HIV infection (115), multiple myeloma (105), lymphoma (89), transplant (88), chronic leukemia (72), asplenia (57), and SLE (46). Overall, 57.8% were male, the median age was 62.3 years (IQR 48.6-73.4). Overall, 723 (70%) presented with pneumonia, 174 (17%) with primary bacteremia, 43 (4.2%) with meningitis, and 33 (3.2%) with empyema. 426/830 (51%) of patients with available data had received the 23-valent pneumococcal polysaccharide vaccine (PPV23) prior to illness. The most common serotypes causing IPD were: 19A (N=111, 11%), 22F (83, 9%), 3 (67,7%), 6C and 7F (43each, 4%), 23A (40, 4%), 4 and 6A (38 each, 4%), 9V (35, 4%). Overall, PCV7 serotypes caused 19% of IPD, but this proportion fell from 33% in 2005-6 to 4.2% in 2011-13. PCV10/not7 strains (ST 1,5,7F) comprised 44 (4.5%) and PCV13/not10 strains (19A,3,6A) comprised 216 (22%).In 2011-13, strains included in PCV13 comprised 85/204 (35%) of all isolates. Estimated PPV23 efficacy by the indirect cohort method was 8% (P=NS). 83 (31%) of patients required ICU care; 57 (22%) required mechanical ventilation, and 56 (22%) died during their hospitalization. In multivariable analysis, older age (OR per decade 1.3, 95% CI 1.2,1.5), presence of cirrhosis (OR 2.6, 95%CI 1.6,3.9) and infection with serotype 3 (OR 1.8, 95% CL 1.1,3.2) were associated with an increased risk of death. Patients with HIV infection (OR 0.27,95% CL 0.10, 0.70) and organ transplantation (0.45, 05% CL 0.22, 0.92) were less likely to die.

**Conclusion:** IC adults comprise nearly one-third of all IPD, and have higher rates of ICU admission and death due to IPD than their non-IC counterparts, although the population is heterogeneous. PPV23 does not appear to be effective in reducing disease. Assessing the effectiveness of PCV13 in preventing disease is warranted.