Background

Every year, approximately 40% women ages 18-69 are undergone Pap smear screening, and 3-4% required follow-up visits for Pap abnormalities. The annual burden of cervical cancer is approximately 1,350 cases and 390 related deaths. Persistent infection with oncogenic HPV types is necessary for progression to pre-cancer and invasive cervical cancer. HPV infection is frequently but not necessarily associated with Pap abnormalities. Improved techniques for Pap smear are being considered in provincial screening programs. Prophylactic HPV vaccines are also being considered for primary prevention. HPV data are needed for baseline assessment of disease burden, planning of prevention programs and their evaluation.

Objectives

To systematically review studies reporting cervical HPV prevalence and associated risk factors among Canadian participants.

Methods

MEDLINE and EMBASE (1990–2006; “human papillomavirus” AND “Canada”) were searched for published studies: 1) Canadian participants, and 2) reporting prevalence data from HPV-DNA tests. Similar studies of limited circulation were identified through back referencing, author searching, and searching the websites of public health agencies. Broad screening and full-text reviewing were conducted independently by two reviewers. Abstracted data included study and participant characteristics, characteristics of HPV-DNA tests, age- and type-specific HPV prevalence, and associated risk factors. Data abstraction was conducted independently by two reviewers. Random-effects model was used to combine prevalence estimates across studies, if appropriate.

Results

A total of 27 studies (31 study reports) were included from broad-screening 307 potentially relevant citations (Figure 1). Both published reports (n = 27 reports) and those with limited circulation (2 theses and 2 abstracts) were included. Included studies are published between 1992 and 2007 with data collected between 1970 (i.e., retrospectively) and 2006. Included studies reporting HPV data from 29,403 participants were conducted in Quebec n = 9; Ontario n = 8; Alberta, Manitoba and Newfoundland n = 2 each; and British Columbia, Saskatchewan, Nunavut, and multiple location n = 1 each. 24 studies collected HPV data prospectively and 3 studies retrospectively.

Study participants were sampled from Pap screening populations (n = 7 studies) and high risk groups (n = 20; e.g., colposcopy referrals, gynecology clinics, STD clinics, Aboriginals, biopsy samples, and cervical cancer cases). HPV was detected via PCR-based testing (n = 14 studies), Hybrid-Capture II (n = 6), both (n = 4), and not reported (n = 3).

Overall, included studies were substantially different with respect to study participants, age distribution, HPV testing and types detected, study period and design, among others.

Results (Continued)

Across five provinces with screening-based data, high-risk (HR) oncogenic HPV prevalence was 14-21% in ages < 20, 8-22% in 20-29, 7-14% in 30-39, 2-13% in 40-49, 3-10% in 50-59, and 1-18% in those ≥60 year-old (Figure 2).

Among infected women / samples, HPV-16 was present in 25% (20-30%) of women / samples with ASCUS (n = 6 studies; Table 3), smoking (2/6), and a higher number of lifetime sexual partners (3/5). Major risk factors included: an earlier age at first intercourse (significantly associated in 4/6 studies), and a higher number of lifetime sexual partners (3/5).

Conclusion

High risk oncogenic HPV prevalence is high in younger and possibly elevated in older age-groups. Existing studies provided limited data to assess age-specific risk of type-specific HPV infection. Population-based data is much needed to inform cervical cancer prevention strategies and monitor impact of vaccination.

Limitations

Included studies were generally small and often insufficient in representing the target populations. Prevalence estimates across studies are subjected to substantial clinical heterogeneity (e.g., differences in participant populations, disease status and detection methods, among others). HPV type data was likely to be influenced by selective reporting bias.