Incidence Trends in Invasive Uterine Cervix Cancer and Carcinoma in Situ in Incheon, South Korea

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Abstract

Introduction: This study examined trends of invasive and carcinoma in situ (CIS) in terms of the incidence and mortality of uterine cervix cancer in Incheon over a twelve year period. Methods: Uterine cervical cancer data were retrieved from the Incheon Cancer Registry (ICR) and Korea Central Cancer Registry (KCCR) from 1997 to 2008. The time trend in age-standardized incidence rates (ASR) of invasive uterine cervix cancer and CIS were calculated and compared with the nation-wide cancer registry data for each year. Mortality/incidence (M/I) ratios according to age and the incidence of pathological subtype in Incheon each year were also examined, along with an international comparison. Results: A total of 3,096 cases of invasive cervical cancer and 2,079 cases of carcinoma in situ were analyzed from 1997 to 2008. The time trend incidence of the total ASR in uterine cervical cancer decreased from 25.7 in 1997 to 13.4 in 2008, but incidence of CIS increased from 7.6 to 15.8 in same period. In invasive cancers, the age-specific incidence rates were highest in those in their sixties and patients in their forties showed highest incidence of CIS. The mortality rate in ICR was 3.7 from 1998 to 2002. Compared to the other countries which have high risk factors for cervix cancer, the peak incidence zone was different in Incheon. Conclusion: The ICR showed a decrease in the incidence of invasive cervical cancer that was similar to the nation-wide data. An early increase zone is a characteristic pattern in the age specific incidence curve. Early screening and a vaccination program should be activated for prevention of young age cervical cancer.

Keywords: Cervix uteri - carcinoma in situ - incidence - epidemiology - age dependence - Incheon, Korea

The present study examined the trend of invasive uterine cervical cancer and carcinoma in situ in terms of the incidence and mortality in Incheon over a twelve year period.

**Materials and Methods**

The Incheon Cancer Registry (ICR) covers 2.7 million people and a total surface of 1,029 km². All cases of invasive cervical cancers and carcinoma in situ from 1997 to 2008 were included in the present study. Data from both ICR and KCCR, which contained 5 other metropolitan cancer registries (Seoul, Daegu, Gwangju, Daejeon, Busan) in Korea, were used. The ICR is a population-based cancer registry. The data of the ICR was obtained from several sources, such as hospital cancer registries in Incheon, Korea National Health Insurance Company data, registration data from other cities in the KCCR and data on cervical cancer deaths and the annual population from the Korea National Statistical Office.

The age standardized incidence rate of invasive cervical cancer and carcinoma in situ in Incheon was calculated by the direct method, using the world standard population and compared with the nationwide data in Korea. The age-specific incidence and mortality were also calculated. The analyzed tumor histopathological subtype in this study included squamous cell carcinoma and adenocarcinoma. Other carcinomas, such as glassy cell type, adenosquamous carcinoma etc., were not shown in the figures because of the low incidence. In the Incheon Cancer Registry, all tumors were coded according to the International Classification of Diseases for Oncology [ICDO-3]. The following histological groups were considered: (1) squamous cell carcinoma (ICDO 8050–8082); (2) adenocarcinoma (ICDO 8140–8550) and adenosquamous (ICDO 8560, 8570); (3) cervical cancers Not Otherwise Specified (NOS; 8000–8004, 8010–8034) and other histological types.

The crude, age standardized incidence rates (per 100,000 person-years) were calculated based on the general guidelines of the International Agency for Research on Cancer. An international comparison was made regarding the incidence and mortality based on the Cancer Incidence in Five Continents Vol. IX.

**Results**

A total of 3,096 cases of invasive cervical cancers and 2,079 cases of carcinomas in situ were registered in the Incheon Cancer Registry from 1997 to 2008. The mean rate of histological verified cases was 96.8% and it was not significantly changed during twelve year period. The main histological subtype was squamous cell carcinoma and its incidence was 79.9%, followed by an adenocarcinoma
The main histological type was squamous cell carcinoma in uterine cervical cancer because most cervical cancers occurred in the exocervix which is composed stratified squamous epithelium. On the other hand, adenocarcinoma and other histological subtypes were also identified. CIS is well known as a precancerous lesion. The declining incidence of female genital cancers, particularly squamous cell carcinoma of the cervix, has been a worldwide trend except in developed countries. Moreover, an improvement in the survival rate of patients was observed in Nordic countries (Klint et al., 2010).

Many articles have reported an increase in the incidence of adenocarcinoma of the uterine cervix (Eifel et al., 1995; Smith et al., 2000; Wang et al., 2004; Missaoui et al., 2010). The ICR data also showed a decreasing tendency in squamous cell carcinoma but the incidence of adenocarcinoma has not been changed with time.

The mean age of the patients with uterine cervix cancer in Incheon was the fourth decade. This incidence and prevalence age group was similar in other cities in Korea (Figure 2). The age-specific incidence of invasive cancer in ICR data appears different from other developing and developed countries (Figure 3) (Sriamporn et al., 2003; Bhurgri et al., 2008). The incidence rates (ASR) of cervical cancer in selected cancer registries worldwide varied from less than 5 to more than 45. In countries with higher incidences, it was the leading cause of cancer death and premature death in women in 1998-2002 (Jemal et al., 2010).

The time trend mortality rate in the ICR data did not change markedly from 3.2 in 1998 to 3.8 in 2008, and it is not widely different from the KCCR data. Regular cancer screening using a PAP smear test allows the detection of precancerous lesions (Vizcaino et al., 2000; Bray et al., 2005; Mathew & George, 2009). Although several developed countries have already established cervical cancer screening programs, a program for those with a lower socioeconomic status based on the government program started in 1999 in Korea. Therefore, although the decreases in proportionate terms were much smaller than those in western countries until now, the trends in cervical cancer are expected to decline furthermore in the future.

A human papilloma virus (HPV) infection is the major risk factor for uterine cervix cancer (Bernal et al., 2008). Younger age at first sexual intercourse, multiple sexual partners, and low socioeconomic status are other risk factors. HPV vaccination for the prevention of uterine cervical cancer started in 2007 in Korea but is not widely used because of the high cost of the vaccine.

In conclusion, although the time trends in the incidence of invasive uterine cervix cancer for twelve years has been decreasing gradually, the incidence of CIS has increased over the same period. Compared to the nation-wide data from the KCCR, similar patterns of change were observed in Korea. Pathologically, the changing rate of squamous cell carcinoma was faster than that of adenocarcinoma. The mortality of cervical cancer has changed slightly. A cancer screening program in Korea has been activated recently, it is important to continue the monitoring.
References
