Review

Ovarian Cancer
Geographical, Host and Environmental Factors
An Overview

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Summary. The incidence of ovarian cancer is reviewed among different races and ethnic groups.

We present the effect of socio-economic class, age, endocrinological factors, menstrual cycle, reproductive history, familial, and genetic factors, viral infections, chemical carcinogens, and previous exposure to radiation on the incidence of ovarian cancer.

There is evidence that environmental factor affects the distribution of various types of ovarian cancer. Migration may also change the susceptibility to this disease and the mean age was varied between countries being lowest where incidence was highest. The disease appeared to have a familial incidence. The protective effect of oral contraceptive steroids and the role of asbestos as a chemical carcinogen are discussed.

Key words: Epidemiology – Ovarian cancer – Geographical factor – Host factor – Environmental factors

Although ovarian cancer is the most lethal of the genital tract cancers in Europe and the USA, much remains to be learned about this disease.

Variation in the occurrence have been found between native and migrant populations and between different populations of the same country. There are hints of environmental and hormonal factors affecting this variation, but with the limited data available it is not possible to identify clearly any risk factors.

Difficulties in the study of ovarian cancer are due to a lack of uniformity in the collection of epidemiological data. Nevertheless, the information available about the incidence of ovarian cancer in various populations and the characteristics of this disease and its associated disorders, provide leads that warrant further research.

In this review, relevant data on incidence, geographical distribution, host and environmental factors will be discussed.

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Incidence

Wide variations are reported in the incidence of ovarian cancer. In Japan the incidence is three cases per 100,000 women/year as against 15.1 cases per 100,000 women/year in Sweden [1]. A more striking difference between Japan and the USA exists also in the death rate of women of 50 years or older from ovarian cancer. The difference cannot be attributed to a genetic factor because the rate of ovarian cancer among Japanese migrants to the USA is similar to that of the white population [2].

Data published by Waterhouse and Doll [3, 4] on cancer incidences in five continents shows the following variation between the different countries.

An incidence of more than 10 women in 100,000 is observed in developed countries (USA 11–13, Canada 10–12, England 11, New Zealand 11.4, Israel 13, and the highest in all – Scandinavian countries, Denmark 15.1, Sweden 15.1, and Norway 14.2).

Countries with incidence rates of five to 10 women per 100,000 are Poland (9.1), Hungary (9.0), Rumania (5.8), Nigeria (7.0), Uganda (7.7), Rhodesia (8.1), and Malta (8.3).

The countries with lowest incidence rates of less than five per 100,000 are: India (4.8), Cuba (4.6), Spain (3.6), and Japan (2.8).

In Europe there is an obvious difference in incidence associated with geographic location. The highest rates are in Scandinavian countries (14.2–15.1), the intermediate rates are in central and eastern Europe (10.0–12.1) and relatively low rates are found in southern Europe (3.6–10.1) [3].

In the United Kingdom which has an incidence of 11.0 per 100,000, there was little regional variation (Oxford 11.7, Birmingham 11.3, Sheffield 11.0, and Liverpool 10.1).

In the USA, states located on the east and west coast had a high incidence of ovarian cancer (California 13.6 and Connecticut 12.6) while a central state like Utah stood at 10.6.

In Canada, there was a low incidence in Alberta (9.8) and Quebec (9.6) and a high incidence in Manitoba (11.6), Newfoundland (11.7), and British Columbia (14.0) [3].

In the developing countries and Japan, some increase has been observed in the death rate from ovarian cancer; this is probably associated with improved diagnostic facilities and generally increased life expectancy.

Some of the differences between countries, may be a reflection of the accuracy of cancer registration and the availability of diagnostic facilities. This cannot be so for differences between different regions of the USA, Canada, Japan, and Western Europe and this indicates environmental factors. The case for environmental predisposing factors rather than genetic factors is strengthened by the fact that descendants of Japanese immigrants to the USA have a higher mortality rate than native Japanese but a lower one than the rest of the white and non-white population [5, 6].