

Hydatidiform mole in China: a preliminary survey of incidence on more than three million women

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A nationwide retrospective survey to determine the incidence of hydatidiform mole has been conducted in China since 1979 by inquiring into the history of past pregnancies. Up to the end of 1983, a total of 3 089 399 women with 10 929 354 pregnancies from 26 provinces, special municipalities and autonomous regions had been investigated. The overall incidence was one mole in 1238 pregnancies (0.81 per 1000 pregnancies). The incidence was higher in five provinces of south-east China than in other parts of the country and higher among the coastal people than inlanders. Ethnic comparisons were made between the major Han and three main minority groups. The incidence was higher among the Zhuang in Guangxi and the Mongolians in Inner Mongolia than among the Han living in the same areas. However, in Ningxia, the incidence among the Hui (Muslims) was almost the same as that of the Han. There was no significant difference in the incidence of hydatidiform mole between urban and rural residents.

The traditional view that hydatidiform mole occurs much more frequently among women in China and other Asian countries has to be revised. The present study shows that the incidence in China is higher than that among Caucasian women in some European countries, but it is by no means as high as previously believed.

Hydatidiform mole is an unequivocal precursor of malignant gestational trophoblastic diseases, i.e., invasive mole and choriocarcinoma. Invasive mole is almost invariably derived from hydatidiform mole and 69.1% of the patients with choriocarcinoma have a history of molar pregnancy (1). Therefore, it is reasonable that any investigation on etiologic factors and preventive measures of malignant gestational trophoblastic diseases should begin with the study of the epidemiology of hydatidiform mole. China as well as many other Asian countries is known to have a high incidence of hydatidiform mole, but the reported rates have mostly been hospital-based and by no means reflect the true occurrence. This report presents the preliminary results of a retrospective nationwide survey on the incidence of hydatidiform mole among more than 3 million women from prefectures all over China.

SUBJECTS AND METHODS

For the investigation of the incidence of hydatidiform mole, retrospective information on past

pregnancies of each study subject was obtained. This was usually done at the time of a mass screening survey for carcinoma of the cervix, which has been carried out as a routine preventive procedure in some districts of China by the local health care organizations for many years. In other areas, a special team was organized to get this information.

After a short feasibility study by the initiators of the investigation at the Peking Union Medical College Hospital, the first conference on this subject was held in November 1978 in Shandong Province, where a National Collaborative Study Group was established. Based on experience from the pilot study, a standardized questionnaire, interview procedures, and methods of statistical treatment of the data were formulated.

The formal investigation began in 1979. In addition to direct interviews with the study subjects, senior family members were questioned and if there had been treatment in a hospital, registration books were checked to remedy possible omissions and mistakes. Through the collaboration of more than 300 medical centres, hospitals and women's health care organizations of different levels, a total of 3 089 399 women from 26 provinces, special municipalities, and autonomous regions were investigated up to the end of 1983. Around 85% of the women were over 30 years of age. Topographically, the areas investigated

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covered the plains, hilly areas, mountainous regions, coastal areas and islands.

The age and parity of the subjects were documented during the inquiry but were not included in the analysis, because the policy of family planning pursued in the last twenty years might lead to some bias in the interpretation of the data. Thus, the advocacy of late marriage would certainly have raised the age of first pregnancy and restrictions on family size would have abolished the occurrence of high parity.

RESULTS

The overall incidence of hydatidiform mole

Among the women surveyed, a total of 10 929 354 pregnancies and 8832 hydatidiform moles were

identified. The overall incidence was one mole in 1238 pregnancies (0.81 per 1000 pregnancies). The incidence rates in different provinces are shown in Fig. 1. It can be seen that the rates are not too divergent, ranging from 0.46 in Shanxi Province to 1.39 per 1000 pregnancies in Zhejiang Province.

Geographical distribution

According to the figures obtained from different provinces, incidence rates may be divided into three groups:

- 1) > 1.0 mole per 1000 pregnancies: 5 provinces, i.e., Zhejiang (1.39), Guangdong (1.37), Hunan (1.14), Jiangxi (1.05), and Fujian (1.03), all situated in south-east China and south of the Yangtze River;
- 2) 0.81–1.0 mole per 1000 pregnancies: 8 provinces, municipalities and autonomous regions, of

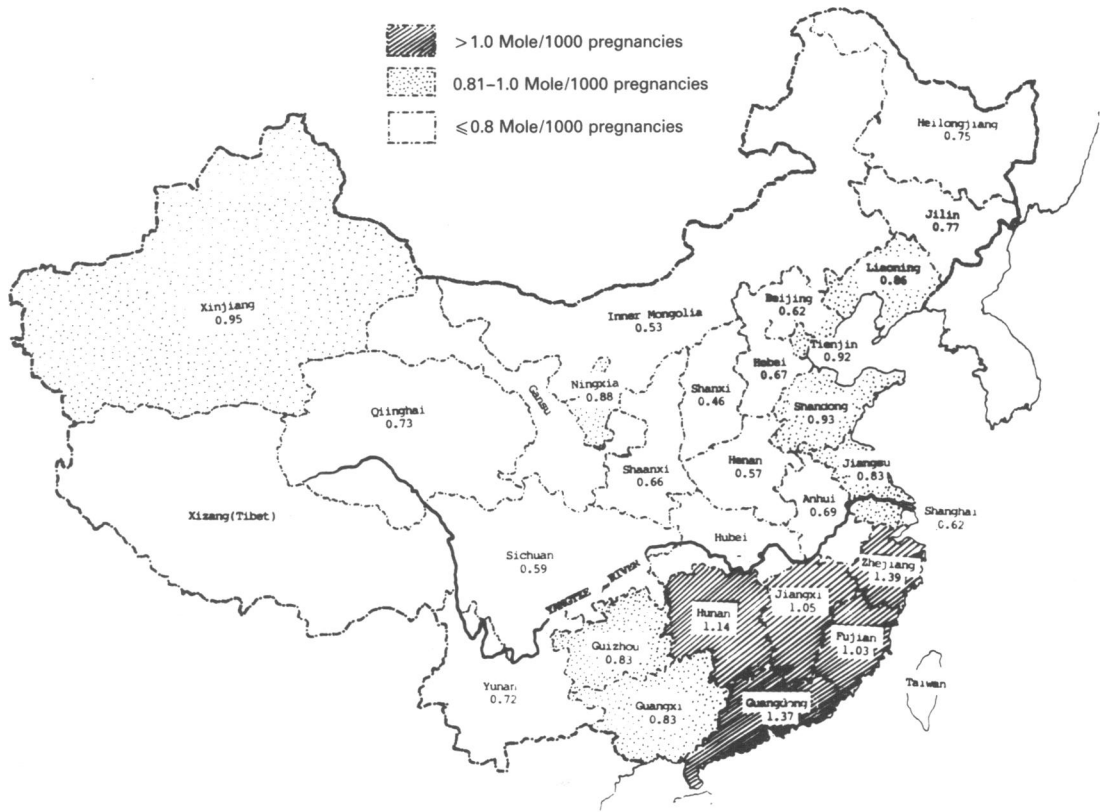


Fig. 1. Map of China, showing the incidence of hydatidiform mole in 26 provinces, special municipalities and autonomous regions.

which 4 belong to the coastal area (Shandong, Liaoning, Jiangsu and Tianjin), 2 belong to an inland region but lying south of the Yangtze River (Guangxi and Guizhou), and 2 are purely inland autonomous regions (Xinjiang and Ningxia);

3) ≤ 0.8 mole per 1000 pregnancies: 13 provinces, municipalities and autonomous regions, of which 12 belong to the inland areas and 9 lie north of the Yangtze River. The differences between 1) and 2), 1) and 3), and 2) and 3) are statistically highly significant ($P < 0.001$).

The higher incidence of hydatidiform mole in coastal areas than in inland regions was demonstrated in some provinces where a more detailed investigation was carried out in different prefectures within a province. For instance, in Hebei Province the incidence in Tangshan, a seaside prefecture, was 1.02 per 1000 pregnancies (147 moles in 144 011 pregnancies), while that in five inland prefectures, i.e., Shijiazhuang, Baoding, Langfang, Chengde and Zhangjiakou, was 0.62, 0.50, 0.54, 0.69 and 0.62, respectively. The difference between the incidence in Tangshan and the combined rate for the latter five prefectures (485 moles in 795 063 pregnancies or 0.61 per 1000 pregnancies) was statistically highly significant ($P < 0.01$). In Shandong province, the combined incidence in two coastal prefectures, i.e., Qingdao and Huiming, was 1.4 per 1000 pregnancies (69 moles in 49 270 pregnancies) and that in three inland prefectures, i.e., Heze, Changwei and Jinan, was 0.87 per 1000 pregnancies (409 moles in 469 791 pregnancies); this difference is also statistically highly significant ($P < 0.01$). In Fujian Province, the combined incidence in four coastal prefectures, i.e., Luoyuan, Changle, Zhangpu and Dongshan, was 1.41 per 1000 pregnancies (99 moles in 70 384 pregnancies), while that in three inland prefectures, i.e., Youxi, Longhai and Yunxiao, was 0.79 (95 moles in 120 934 pregnancies); this difference is again highly significant ($P < 0.01$).

Table 1. Comparison of incidence of hydatidiform mole between urban and rural residents

Residence	No. of pregnancies	No. of moles	Incidence (per 1000 pregnancies)
Urban	5 306 317	4342	0.82
Rural	5 623 037	4490	0.80
Total	10 929 354	8832	0.81

Urban vs. rural residents

Considering the present study population as a whole, the incidence of hydatidiform mole among urban residents was 0.82 per 1000 pregnancies, compared with 0.80 among rural residents (Table 1). The difference is not statistically significant ($P < 0.05$). However, in 16 provinces where data for both rural and urban residents were available for comparison, the incidence was higher among urban residents than rural residents in 5 provinces and lower in 8, although again no statistically significant differences were observed. In the remaining 3 provinces, the incidence was similar.

Ethnic differences

China is a country with many ethnic groups. Besides the majority Han, there are important minorities living in the autonomous regions. In Table 2, the incidence of hydatidiform mole among the Han is compared with that in the main minorities in three autonomous regions. The incidence among the Zhuang in Guangxi (south-west China) and the Mongolians in Inner Mongolia is higher than that among the Han living in the same areas. The

Table 2. Comparison of incidence of hydatidiform mole between Han and 3 main minorities

Autonomous region	Ethnic group	No. of pregnancies	No. of moles	Incidence (per 1000 pregnancies)	P value
Guangxi	Han	693 087	485	0.69	< 0.001
	Zhuang	86 916	93	1.07	
Inner Mongolia	Han	264 884	131	0.49	< 0.05
	Mongolian	27 904	24	0.86	
Ningxia	Han	43 264	47	1.08	> 0.05
	Hui (Muslim)	8 229	9	1.09	

differences are statistically significant. However, in Ningxia Autonomous Region the incidence among the Hui (a very important Muslim minority in north-west China) was almost the same as that in the Han. However, because of the relatively smaller number of minority women surveyed, the results are far from conclusive.

DISCUSSION

Assessment of the reliability of the results

Three million women investigated in this study constitute only a very small fraction of the gigantic population of one billion male and female Chinese. However, because the data were derived from 26 of the total of 30 provinces, special municipalities and autonomous regions, it is reasonable to consider the present results as representative of the real incidence of hydatidiform mole in the country. However, early aborted molar pregnancies might have escaped being noted by the study subjects themselves, and a few women, for superstitious reasons, may have been reluctant to tell the interviewers that they had once passed a mole. Both these possibilities would lead to an underestimate of the incidence of hydatidiform mole. On the other hand, some early abortions might have been mistaken by the patients as a missed period and this would in turn reduce the size of the denominator—the number of pregnancies—and contribute to an overestimate of the incidence. Considering the large size of the sample investigated, these two factors may be assumed to cancel out without unduly influencing the overall results of the study.

The myth of high incidence of hydatidiform mole among Asian women

It has long been the belief of medical workers all over the world that women from east and south-east Asia have a high incidence of hydatidiform mole, ranging from several to more than ten times that of

Table 3. Selected hospital-based incidence of hydatidiform mole in east and south-east Asia

Country	Published year	Incidence per 1000 pregnancies)	Reference
China	1957	6.67	Song et al. (1)
Indonesia	1965	11.8	Poen & Djojopranoto (2)
Philippines	1967	5.0	Acosta-Sison (3)

Table 4. Selected population-based incidence of hydatidiform mole in different countries

Country	Published year	Incidence (per 1000 pregnancies)	Reference
China	1985	0.81	Present authors
Japan	1967	1.92	Ishizuka et al. (4)
Japan:			
Hokaido	1979	2.79	Ichinoe et al. (5)
Sapporo	1979	2.07	Shiina & Ichinoe (6)
Malaysia	1965	1.31	Llewellyn-Jones (7)
Sweden	1970	0.64	Ringertz (8)
United States	1982	1.10	Hayashi et al. (9)

Caucasians. As shown in Table 3, the incidence of hydatidiform mole in China in 1957 was estimated to be 6.67 per 1000 pregnancies (1) and that in Indonesia in 1965 was as high as 11.8 (2). However, these incidence rates were based on hospital reports before 1970 when the conception of epidemiological studies of malignant tumours was still undeveloped, particularly in developing countries. In the real situation in China, many normal births would have occurred in the home, while most molar pregnancies would have been managed in the hospitals owing to bleeding or other complications. Therefore, it is apparent that all hospital-based studies would lead to inflated incidence rates. Comparing the hospital-based rate of 6.67 per 1000 pregnancies with the population-based incidence of 0.81 in the present study, an 8.2-fold difference is demonstrated. In Table 4, this population-based incidence of molar pregnancy in China is compared with the corresponding figures from Japan, Malaysia, Sweden and the USA. It is surprising to find that the incidence of hydatidiform mole in China is lower than that in the USA (1.1 per 1000 pregnancies) (9), a multiracial country with mainly Caucasians, but higher than that reported in Sweden (0.69 per 1000 pregnancies) (8), which is almost exclusively composed of Caucasians. The population-based incidence seems to be a little higher in Japan (4–6) than in Malaysia (7) where the rate is close to that in the USA. Thus, from this preliminary population-based survey in China it appears that the traditional idea regarding a high frequency of hydatidiform mole among Chinese and other Orientals should be re-evaluated. Although the incidence is shown to be higher than that for Caucasian women in some European countries, it is by no means as high as previously believed.

Diversity in incidence of hydatidiform mole in relation to geographical distribution

It is interesting to note that the incidence of molar pregnancy was significantly higher among women in south-east China than in other parts of the country, and higher among the coastal population than inlanders. An explanation for these differences is still lacking. Low socioeconomic status and malnutrition, which have been suggested as increasing the risk of hydatidiform mole, do not seem to be associated with the high incidence in China. The 5 provinces of south-

east China are known to be rich and abundant in food production, while the coastal people generally enjoy a higher standard of living than the inlanders. Types of food may play a part, for rice and fish are favoured by the people of the south-east and coastal regions. Farm chemicals and industrial pollution of various sources may also be linked with the increased incidence, but these factors have become important only in recent years. Further thorough investigations are therefore required for testing these hypotheses and for clarifying the role of other relevant factors.

RÉSUMÉ

CHINE: ENQUÊTE PRÉLIMINAIRE SUR L'INCIDENCE DE LA MÔLE HYDATIFORME, PORTANT SUR PLUS DE TROIS MILLIONS DE FEMMES

En Chine, une enquête rétrospective a été menée à l'échelon national afin de déterminer l'incidence de la môle hydatiforme depuis 1979, d'après les dossiers de grossesse. Jusqu'à la fin 1983, l'étude a porté sur un total de 3 089 399 femmes provenant de 26 provinces, municipalités spéciales et régions autonomes, et sur 10 929 354 grossesses. L'incidence totale était d'une môle pour 1238 grossesses (0,81 pour 1000 grossesses). Cette incidence était plus élevée dans 5 provinces du sud-est de la Chine qu'ailleurs dans le pays et plus élevée dans la population côtière qu'à l'intérieur du pays. On a effectué des comparaisons ethniques entre le groupe le plus important, les Han, et trois autres groupes principaux. L'incidence était plus élevée chez les Zhuang du

Guangxi et chez les Mongols de Mongolie intérieure que chez les Han vivant dans les mêmes régions. Toutefois, dans le Ningxia, l'incidence était à peu près la même chez les Hui (musulmans) que chez les Han. On n'a relevé aucune différence significative dans l'incidence de la môle hydatiforme entre habitants des zones urbaines et rurales.

La conception traditionnelle qui veut que la môle hydatiforme survienne beaucoup plus souvent chez les Chinoises et les femmes des autres pays asiatiques est à revoir. La présente étude montre que l'incidence de cette affection est plus élevée chez les Chinoises que chez les Blanches de certains pays européens, mais elle n'est en aucun cas aussi élevée qu'on le croyait auparavant.

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