

Epidemiology of peptic ulcer disease in Wuhan area of China from 1997 to 2002

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Abstract

AIM: To describe the epidemiological features of peptic ulcer disease in Wuhan area during 1997-2002, to analyze the sex, age and occupation characteristics, as well as the geographic distribution of peptic ulcer disease, and to determine the effective methods of preventing and controlling peptic ulcer disease.

METHODS: In the early 1980s, the peptic ulcer disease registry system was established to collect the data of peptic ulcer disease in Wuhan area. Here we performed a statistically detailed analysis of 4876 cases of peptic ulcer disease during 1997-2002.

RESULTS: The morbidity of peptic ulcer disease between males and females was significantly different ($\chi^2 = 337.9$, $P < 0.001$). The majority of peptic ulcer diseases were found at the age of 20 to 50 years. Because of different occupations, the incidence of peptic ulcer disease was different in different areas.

CONCLUSION: The incidence of peptic ulcer disease is highly associated with sex, age, occupation and geographic environmental factors. By analyzing the epidemiological features of peptic ulcer disease, we can provide the scientific data for prevention and control of peptic ulcer disease.

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INTRODUCTION

During 1997 to 2002, 21693 patients had a gastroscopy in Outpatient Department of the Renmin Hospital in Wuhan University, of them, 4876 were diagnosed as peptic ulcer disease. Factors that increased the risk of serious peptic ulcer disease included older age, history of peptic ulcer disease, gastrointestinal hemorrhage, dyspepsia and previous non-steroidal anti-inflammatory drug-associated (NSAID) intolerance, as well as poor living conditions^[1]. Furthermore, the epidemiological factors were important reasons leading to peptic ulcer disease. To explore the epidemiological features of peptic ulcer disease in

Wuhan area, we performed a statistical analysis of the data about sex, age, occupation and geographic environmental distribution.

MATERIALS AND METHODS

A total of 21 693 patients with gastrointestinal symptoms received a gastroscopy in Outpatient Department of the Renmin Hospital of Wuhan University, of them, 4 876 were diagnosed as peptic ulcer disease. The patients were classified according to gastric ulcer (GU), duodenal ulcer (DU), complex ulcer (CU), sex, age, occupation and geographic environment and a database was set up. All the data were checked and analyzed using the SPSS statistical software.

RESULTS AND DISCUSSION

Peptic ulcer disease mainly refers to the chronic ulcer which occurs in stomach and duodenum, because the formation of ulcer is linked to the digestive function of gastric acid-pepsin^[2]. Peptic ulcer disease is a worldwide common disease, but the incidence of peptic ulcer disease in different countries and regions is obviously different. The incidence of peptic ulcer disease has not been exactly investigated in China. Therefore, we performed a statistically detailed analysis of the data in Wuhan area from 1997 to 2002.

There were 4 876 cases of peptic ulcer disease out of 21 693 patients, and the incidence was 22.5%. Among the 4 876 cases diagnosed as peptic ulcer disease by gastroscopically, 3 899 males (79.9%) and 977 females (20.1%) had peptic ulcer disease. The sex ratio (males to females) was 3.95:1. Among the patients with peptic ulcer disease, 3 397 had duodenal ulcer disease, 1066 had gastric ulcer disease and 413 had complex ulcer disease. Duodenal ulcer diseases accounted for 69.6%, gastric ulcer diseases accounted for 21.9% and complex ulcer diseases accounted for 8.5%. The ratio of the three was 8.2:2.6:1. The data of the sex, age, occupation characteristics and geographic distribution of peptic ulcer disease are shown in Tables 1-4.

Table 1 Sex ratio of six different age groups in 4 876 cases of peptic ulcer disease

Age (yr) group	Duodenal ulcer	Gastric ulcer	Complex ulcer	Peptic ulcer
10-	3.66	5.00	10.00	3.96
20-	5.13	4.03	6.13	4.93
30-	4.12	4.63	7.53	4.39
40-	2.65	5.82	3.04	3.26
50-	2.53	5.56	2.86	3.37
60-	3.43	5.70	6.75	4.39
Mean	3.59	5.12	6.05	4.05

Sex difference

The incidence of peptic ulcer disease in males was always higher than that in females in different age groups. From Table 1, we could see that the sex ratio in duodenal ulcer disease was 2.53-5.13:1, the maximum ratio was 5.13, and the average ratio was 3.59. The sex ratio in gastric ulcer disease was 4.03-5.82:1, the maximum ratio was 2.53, and the average ratio was 5.12. The cases of complex ulcer disease were so few that they had no

statistic significance. After analyzing the trend of the mortality of peptic ulcer disease from 1952 to 1980 in Western Germany, we found that the general trend of mortality of males was descending but there was a fluctuating ascending, and the general trend of mortality of females was steadily ascending^[3]. Since the early 1960s in America, the incidence of the peptic ulcer disease in males has slightly decreased, but that of females has shown the increasing trend, and the difference of sex has gradually lessened^[4]. Mortality from non-perforated ulcer decreased markedly, while that from perforated ulcer decreased slightly, similar trends were observed in men and women^[5]. We carried out a statistical analysis of the data according to the different age groups ($\chi^2 = 337.9, P < 0.001$). From Table 2 and Figure 1, we could see that the incidence of peptic ulcer disease between males and females was significantly different.

Table 2 Comparison of sex among six different age groups in 4 876 cases of peptic ulcer disease

Gender	Age(yr) group					
	10-	20-	30-	40-	50-	60-
Male	190	858	1 340	880	576	282
Female	48	174	305	270	171	65

$\chi^2 = 337.9, P < 0.001$.

Table 3 Age distribution in 4 876 cases of peptic ulcer disease

Age (yr) group	Duodenal ulcer		Gastric ulcer		Complex ulcer	
	Male	Female	Male	Female	Male	Female
	10-	150	41	30	6	10
20-	656	128	153	38	49	8
30-	932	226	295	64	113	15
40-	519	196	285	49	76	25
50-	263	104	250	45	63	22
60-	141	41	114	20	27	4
Total	2 661	736	1 127	222	338	75

Table 4 Occupation distribution in six different age groups in 1 068 cases of peptic ulcer

Age (yr) group	Worker			Farmer			Cadre			Student		
	DU	GU	CU	DU	GU	CU	DU	GU	CU	DU	GU	CU
	10-	2	1	0	0	1	0	2	0	0	24	6
20-	86	18	6	36	12	4	6	2	0	10	0	0
30-	168	22	8	96	44	8	32	20	2			
40-	26	6	6	66	38	14	34	14	4			
50-	28	10	2	32	26	8	16	16	2			
60-	18	8	2	14	28	2	12	12	2			
Total	328	65	24	244	149	36	102	64	10	34	6	6

Age distribution

People who suffered from peptic ulcer disease could be found out at whatsoever ages, but the majority of patients with peptic ulcer disease were adults. Our data indicated that the youngest patient was 9 years old, the oldest was 73 years old, 78.7% of the patients were between 20 and 50 years old, the peak age of incidence was between 30 and 40 years old in duodenal ulcer disease patients. In gastric ulcer disease patients, the youngest was 11 years old, and the oldest was 75 years old, 82.9% of the patients were between 20 and 50 years old, 92.2% of the patients were between 30 and 60 years old, and the peak age of incidence was between 30 and 40 years old. People with gastric ulcer disease were older than those suffering from duodenal ulcer

disease. The incidence of peptic ulcer disease in patients between 40 and 60 years old was obviously higher than that in patients between 10 and 30 years old. The actual number of peptic ulcers in the elderly decreased, however the percentage of elderly with peptic ulcer against total population increased^[6]. The age distribution of complicated ulcer disease was basically similar to that of gastric ulcer disease. The incidence of peptic ulcer disease was 22.5% in Wuhan area, the ratio of duodenal ulcer to gastric ulcer was 3.2:1, and the ratio of different age groups was 1.24-5.1:1. From Figure 2, we could see that the incidences of duodenal ulcer disease and gastric ulcer disease were not significantly different after 50 years old. Huang *et al.*^[7] found that peptic ulcer disease in children over 6 years old was mainly primary ulcer, the majority of them were duodenal ulcer, and the clinical symptoms of the peptic ulcer were similar to those in the adults. It was reported that 72-80% of peptic ulcer disease in Hunan and Guangdong provinces in China occurred in patients between 20 and 50 years old, which was similar to the results of the reports from India^[8]. The location of duodenal ulcer disease was on anterior wall and greater curvature of bulb, but in gastric ulcer disease was on gastric angle and antrum, and the peak age of incidence was 21 to 50 years^[9]. The results of our investigations were basically similar to them.

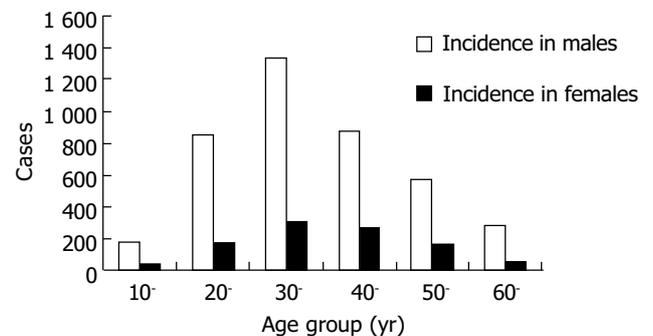


Figure 1 Age and sex distribution of peptic ulcer disease in Wuhan area, China.

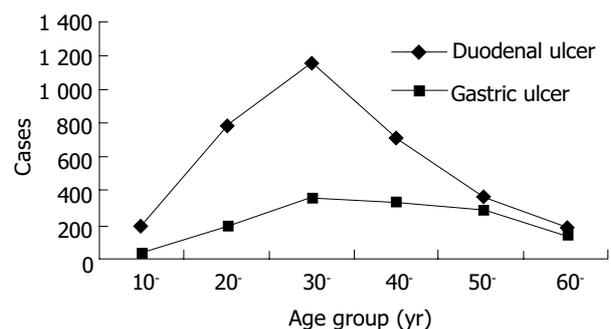


Figure 2 Age distribution of 4 876 cases of peptic ulcer disease in Wuhan area.

Social occupation factors

The sex difference and age distribution of peptic ulcer disease in different occupations were basically the same. The data of our study were divided into four parts, each from the workers, farmers, students and cadres, respectively. From Table 4, we know that the incidence of peptic ulcer disease among farmers was the highest, moderate in workers and the lowest in students. The incidence of duodenal ulcer disease was also very high among these special occupations such as drivers, firefighters and so on, which was similar to the report of Sonnenbeg *et al.*, who found the incidence of duodenal ulcer disease was very high among the firefighters, pilots and shift workers^[10,11]. The

study results from Western Germany indicated that the consumption of body's energy was a dangerous factor for the development of peptic ulcer disease^[11]. This may be related to social factors such as busy working, heavy mental stress and so on. It was reported that the occurrence, recurrence of peptic ulcer disease were closely associated with psychological contradiction, emotional-hindering and defective character. Depress, anxiety, fear, emotional irritability and cognitive disorganization were significantly increased in the integrated stress management program (ISMP) group in comparison with the progressive muscle relaxation (PMR) group, and the incidence of peptic ulcer disease was higher in the ISMP group than in the PMR group^[12]. In addition, irregular meal, over-eating, and fast-eating might cause injures to the digestive tract mucosa, leading to the occurrence of peptic ulcer disease^[13]. Peptic ulcer disease was more common in the working age groups. To any kind of occupation, age between 20 and 50 years was a period in which people were widely connected with society and participation in assorted social activities more frequently than ever. Heavy social psychological stress, frequent mobility and irregular working were extremely important factors in the formation of peptic ulcer disease. The increasing incidence of peptic ulcer disease in females was related to more and more social activities that females participated in gradually^[14].

Geographic and environment factors

Environmental factors played a role in peptic ulcer disease^[15]. The positive detectable rate of peptic ulcer disease in Han nationality was higher than that in Korea nationality at Yanbian area^[16]. Thors *et al.*^[17] demonstrated that peptic ulcer mortality and disease risk were particularly high in subjects born after the turn of the century and subsequent generations. Since 1945, a very rapid economic development has been achieved with the advent of electricity and refrigeration, clean water and food; The condition in Iceland changed from being anti-hygienic and poor to being rich and clean, the morbidity of peptic ulcer disease has decreased. The rise and fall in peptic ulcer during the 20th century might be caused by factors early in life in the generations born during these years with crowding and poor hygiene before living conditions and socio-economic status were improved. The incidence of peptic ulcer disease as reported was between 16% and 33% from different regions in China. The results from Hunan and Gansu Provinces indicated that the ratio of duodenal ulcer disease to peptic ulcer disease was 2.7-6.2:1 in the inpatient department during the same period. The peptic ulcer disease is very prevailing in all over China, but there is an increasing trend from the north to the south in region distribution. Furthermore, the morbidity of peptic ulcer disease is also different in different countries, and duodenal ulcer disease turns up more frequently than gastric ulcer disease in the majority of Western countries. The study report in Japan indicated that the incidence of gastric ulcer disease was higher than that of duodenal ulcer disease. The incidence of duodenal ulcer disease and gastric ulcer disease was almost equal to that in Norwegian. In respect to ethnicity, Bengali speaking Hindus showed high probability for gastric ulcers in both sexes^[18]. The detecting rates of peptic ulcer disease in Han and Hui nationalities were 13.42% and 10.66% respectively. Among peptic ulcer diseases 44.4% were duodenal ulcer disease, and 50.63% were gastric ulcer disease, the ratio being 0.88:1. The detecting rate of peptic ulcer in Han nationality was higher than that in Hui nationality, and gastric ulcer disease occurred

more often than duodenal ulcer disease in china. The regional difference in the type and level of peptic ulcer disease revealed that geographic and environmental factors probably played an important role in the development of peptic ulcer disease. Additionally, the incidence of peptic ulcer disease in the transition period between autumn and winter or between winter and spring was higher than that in other periods. The change of climate factors was also associated with occurrence of peptic ulcer disease; with the change of temperature and atmosphere, patients with peptic ulcer disease would appear gastroperiodynia.

In conclusion, the occurrence of peptic ulcer disease is highly associated with sex, age, occupation, geographic and environmental factors. By analyzing the epidemiological characteristics of peptic ulcer disease, we can provide the scientific data for prevention and control of peptic ulcer disease.

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