Clinics in Medicine

ISSN: 2688-6731

Research Article

Analysis on the Characteristics of Malignant Tumors Treatment in Chongqing (Main Urban Area) from 2017-2019*

*Gao Cui-e, Liao Shi-Ming, Sun Hao and He Miao**

Chongqing Key Laboratory of Translational Research for Cancer Metastasis and Individualized Treatment, Chongqing University Cancer Hospital, Chongqing, China

Abstract

Objective: To analyze the characteristics of malignant tumors treatment in Chongqing (main urban area) from 2017-2019.

Methods: We collected and analyzed the data of special medical insurance registration for malignant tumors (reflect malignant tumors treatment directly) in Chongqing (main urban area) managed by the Chongqing University Cancer Hospital from 2017 to 2019.

Results: From 2017-2019, there were 20346, 23672, and 26765 cases of malignant tumors registered, respectively, including 11016, 12628 and 13938 male cases; 9330, 11044 and 12827 female cases; 4568, 7609 and 12008 cases of invasion and metastasis, respectively. The malignant tumors treatment peaked in male at the age of 60 years to 70 years old but peaked in women from the age of 40 years old. The top 5 malignant tumors in males were lung cancer, colorectal cancer, liver cancer, esophageal cancer and prostate cancer; the top 5 in females were breast cancer, lung cancer, thyroid cancer, cervical cancer and colorectal cancer. Among the common malignant tumors, thyroid cancer showed the youngest median age of treatment (41 years to 46 years old); prostate cancer showed the oldest median age of treatment (74 years old). Thyroid cancer was the only common malignant tumor that attacked women more than men besides breast cancer, cervical cancer and ovarian cancer. All other common malignant tumors attacked men more than women. The highest invasion and metastasis rates were showed in pancreatic cancer, ovarian cancer, prostate cancer and lung cancer, and the lowest rates were in thyroid cancer and bladder cancer. Compared with the national data of malignant tumors in 2015, the composition ratio of malignant tumors in Chongqing (main urban area) was significantly different with unique characteristics.

Conclusion: The spectrum of malignant tumors in Chongqing (main urban area) has its own characteristics. The tumor screening in Chongqing should consider the differences in gender, age and composition of common malignant tumors.

Keywords: Malignant tumor; Chongqing; 2017; 2018; 2019

Introduction

Malignant tumors are serious threats to human health. Each year, malignant tumors attack about 14 million people and cause about 8.2 million deaths globally; 57% of new cases and 65% of deaths occur in developing countries [1]. Studies have shown that the incidence of malignant tumors is increasing significantly in China [2,3]. Malignant tumors have become the leading cause of death among Chinese [4].

The onset of malignant tumors may be associated with factors such as genetic mutation, smoking, chronic infections (e.g., helicobacter pylori, hepatitis B virus and Human Papillomavirus (HPV)), obesity, unhealthy lifestyle, environmental pollution and occupational exposure [5-8]. Chinese government attaches great importance to tumor prevention and treatment [9].

Chongqing is the largest municipality in China and a central city in western China. Data of the incidence of malignant tumors in Chongqing have been released intermittently but not in a regular and specific way [10]. This is neither conducive to the development of Chongqing malignant tumor prevention and treatment program from an overall situation nor the evaluation of effects on the prevention and treatment.

Chongqing University Cancer Hospital (Chongqing Cancer Research Institute, Chongqing Cancer Hospital) undertakes the management and registration of special medical insurance for malignant tumors among citizens in Chongqing (main urban area). These data directly reflect the annual characteristics of malignant tumors treatment in Chongqing (main urban area, nearly 9 million people). This paper analyzed the registration data of special medical insurance for malignant tumors in Chongqing (main urban area) from 2017 to 2019 and compared them with the previous data as well as the national data, hoping to provide a theoretical basis for the development of malignant tumor prevention and treatment program in Chongqing [11].

Materials and Methods

General data

The data of special medical insurance for malignant tumors in Chongqing (main urban area) registered in Chongqing University Cancer Hospital (Chongqing Cancer Research Institute, Chongqing Cancer Hospital, Chongqing Cancer Center) from 2017 to 2019.

Methods

The data were collated, organized and statistically analyzed.

Citation: Cui-e G, Shi-Ming L, Hao S, Miao H. Analysis on the Characteristics of Malignant Tumors Treatment in Chongqing (Main Urban Area) from 2017-2019*. Clin Med. 2020; 2(2): 1026.

Publisher Name: Medtext Publications LLC

Manuscript compiled: Nov 18th, 2020

***Corresponding author:** He Miao, Department of Gastrointestinal Surgery, Chongqing University Cancer Hospital, 181 Hanyu Road, Shapingba District, Chongqing, China, Tel: 13996123692; E-mail: hemiao7777777@163.com

Statistical processing

SPSS 17.0 software was used to compare the composition ratios of common tumors. Count data were expressed as rate/percentage/composition ratio and processed using Chi square test (α=0.05). P<0.05 was considered statistically significant.

Results

Overview

The registered data of special medical insurance for malignant tumors (reflect tumor treatment) in Chongqing (main urban area, about 9 million people) from 2017 to 2019 are shown in Table 1, characterized by an annual case increase, more males cases than female ones, a median age of 60 years old, nearly 90% of pathologically confirmed diagnosis and an increasing rate of metastasis.

Age distribution

In the registered data from 2017 to 2019, the highest number of patients with malignant tumors treatment was showing in age group of 60 years to 70 years old, followed by age of 50 years to 60 years old, then 70 years to 80 years old and 40 years to 50 years old as shown (Figure 1).

The most common age of tumor treatment in male cases was between 60 years to 70 years old, followed by age group of 70 years to 80 years old and 50 years to 60 years old, with similar number of cases as shown in (Figure 2). Among female patients with malignant tumors, the cases in age group of 60 years to 70 years old, 50 years to 60 years old and 40 years to 50 years old were similar and significantly more than other age groups as shown in (Figure 3).

Table 1: Data of special medical insurance for malignant tumors in Chongqing urban area from 2017 to 2019.

	2017	2018	2019
Total number	20346	23672	26765
Male / female	11016/9330	12628/11044	13938/12827
Median age (year)	0-101 (61)	0-99 (60)	0-99 (60)
Pathologically confirmed diagnosis (%)	18005 (88.5%)	21009(88.8 %)	23862 (89.2%)
Imaging and clinical diagnosis (%)	2341(11.5 %)	2663 (11.2 %)	2903 (10.8%)
Metastasis (%)[a]	4568 (22.45%)	7609(32.14%)	12008 (44.9%)

a: indicating all metastases such as lymphatic metastasis and distant metastasis.

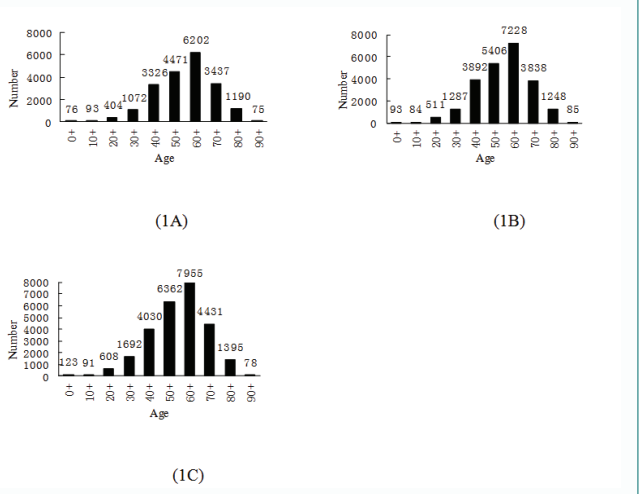

Figure 1: (A): Number of cases of malignant tumors treatment at each age group in 2017; (B): Number of cases of malignant tumors treatment at each age group in 2018; (C): Number of cases of malignant tumors treatment at each age group in 2019.

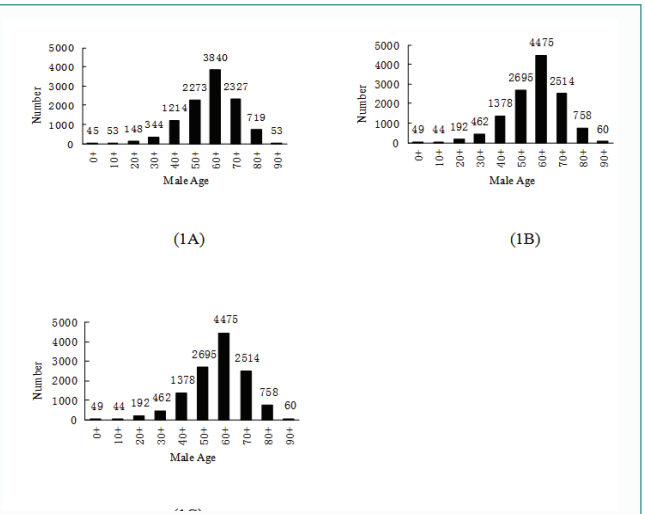

Figure 2: (A): Number of cases of malignant tumors treatment at each age group in 2017; (B): Number of cases of malignant tumors treatment at each age group in 2018; (C): Number of cases of malignant tumors treatment at each age group in 2019.

Type distribution

In general, the most common malignant tumors were lung cancer, colorectal cancer and breast cancer, followed by thyroid cancer, liver cancer and cervical cancer. Besides, esophageal cancer, gastric cancer and prostate cancer were also stably ranked among the tops as shown in (Table 2). The sum of these 9 types of malignant tumors accounted for 69.5%, 71.3% and 72.4% of the total registered number of special medical insurance for malignant tumors in Chongqing (main urban area) from 2017 to 2019, respectively.

For men, lung cancer, colorectal cancer, liver cancer, esophageal cancer, prostate cancer and gastric cancer were the most common malignant tumors as shown in (Table 3). The sum of these 6 types of malignant tumors accounted for 66.5%, 67.0% and 67.9% of the total male number of special medical insurance for malignant tumors from 2017 to 2019, respectively.

While for women, breast cancer, lung cancer, thyroid cancer, cervical cancer, colorectal cancer and ovarian cancer were the most common ones as shown in (Table 4). The total number of these 6 types of malignant tumors accounted for 66.9%, 69.6% and 70.6% of the total female number of special medical insurance for malignant tumors from 2017 to 2019, respectively.

Characteristics of common malignant tumor

We focused on 15 common malignant tumors, and thyroid cancer was found to have the youngest median age of treatment (41 years to 46 years old), followed by leukemia (45 years to 50 years old), then cervical cancer, breast cancer and nasopharyngeal carcinoma (50 years to 52 years old). Prostate cancer was found to have the oldest median age of treatment (74 years old), followed by bladder cancer (68 years old), esophageal cancer (66 years old) and pancreatic cancer (65 years old) as shown in (Tables 5A, B).

At the time of special medical insurance registration, the most obvious invasion to adjacent organs or distant metastasis was shown in pancreatic cancer (38.3% to 43.9%), followed by ovarian cancer (25.8% to 49.9%), lung cancer (28.4% to 36%), prostate cancer (31.2%

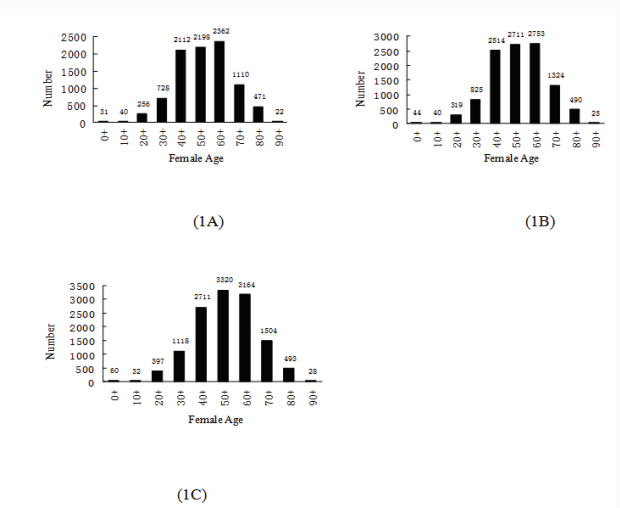

Figure 3: (A): Number of female cases of malignant tumors treatment at each age group in 2017; (B): Number of female cases of malignant tumors treatment at each age group in 2018; (C): Number of female cases of malignant tumors treatment at each age group in 2019.

to 34.9%), colorectal cancer (14.3% to 15.7%), gastric cancer (9.5% to 13.8%) and liver cancer (9.3% to 11.2%). While the least invasion and metastasis showed in thyroid cancer (0.6% to 0.7%), followed by bladder cancer (1.7% to 3.6%) and cervical cancer (2.9% to 3.9%).

In terms of male to female ratio, thyroid cancer was the only one that attacked women significantly more than men besides gender-specific tumors (breast cancer, cervical cancer, ovarian cancer, and prostate cancer), with an male to female ratio of about 1:3. Other common malignant tumors attacked men more than women, including lung cancer with a male-female ratio of about 2:1, liver cancer with a ratio of 4:1, esophageal cancer with a ratio of 4:1, gastric cancer with a ratio of 5:2, bladder cancer with a ratio of 5:1, and nasopharynx cancer with a ratio of 5:2. In addition, we also found a significant gender difference in larynx cancer, with a male to female ratio of 161:4, 210:7 and 210:8 from 2017 to 2019, respectively.

Composition ratio of tumors

The composition ratios of common tumors in data of special medical insurance for malignant tumors in Chongqing (main urban area) from 2017-2019 are shown in Table 6.

Discussion

From 2017 to 2019, there were more than 20,000 cases of special medical insurance for malignant tumors in Chongqing (main urban area, about 9 million people) managed by the Chongqing University Cancer Hospital each year (directly reflect the malignant tumors treatment every year). The number of cases was significantly increased compared with that in 2015 and 2016 [12]. The possible reasons are, firstly, increasing annual new-developed malignant tumors in Chongqing; secondly, increasing coverage of the basic medical insurance in Chongqing; thirdly, increasing awareness of citizens in

Table 2: Type of malignant tumors from 2017 to 2019.

2017	Number of cases (%)	2018	Number of cases (%)	2019	Number of cases (%)
Lung cancer	4794 (23.56%)	Lung cancer	5629 (23.78%)	Lung cancer	6622 (24.7%)
Colorectal cancer	2223 (10.93%)	Colorectal cancer	2433 (10.28%)	Colorectal cancer	2824 (10.6%)
Breast cancer	1800 (8.85%)	Breast cancer	2243 (9.48%)	Breast cancer	2514 (9.4%)
Liver cancer	1290 (6.34%)	Thyroid cancer	1588 (6.71%)	Thyroid cancer	1939 (7.2%)
Thyroid cancer	1209 (5.94%)	Liver cancer	1504 (6.35%)	Liver cancer	1695 (6.3%)
Cervical cancer	857 (4.21%)	Cervical cancer	1119 (4.73%)	Cervical cancer	2514 (9.4%)
Esophageal cancer	795 (3.91%)	Esophageal cancer	864 (3.65%)	Esophageal cancer	941 (3.5%)
Gastric cancer	640 (3.15%)	Gastric cancer	818 (3.46%)	Gastric cancer	874 (3.3%)
Prostate cancer	541 (2.66%)	Prostate cancer	686 (2.90%)	Prostate cancer	779 (2.9%)
Lymphoma	493 (2.42%)	Nasopharynx cancer	585 (2.47%)	Lymphoma	667 (2.5%)
Brain tumor (malignant)	462 (2.27%)	Lymphoma	561 (2.37%)	Kidney cancer	526 (2.0%)
Nasopharynx cancer	450 (2.21%)	Bladder cancer	449 (1.90%)	Nasopharynx cancer	505 (1.9%)
Kidney cancer	410 (2.02%)	Brain tumor (malignant)	441 (1.86%)	Pancreatic cancer	490 (1.8%)
Bladder cancer	406 (2.00%)	Kidney cancer	425 (1.80%)	Bladder cancer	467 (1.7%)
Pancreatic cancer	379 (1.86%)	Pancreatic cancer	397 (1.68%)	Ovarian cancer	434 (1.6%)
Leukemia	363 (1.78%)	Leukemia	392 (1.66%)	Leukemia	390 (1.5%)
Ovarian cancer	299 (1.47%)	Ovarian cancer	372 (1.57%)	Brain tumor (malignant)	265 (1.0%)

Table 3: Type of malignant tumors in male from 2017 to 2019.

2017	Number of cases (%)	2018	Number of cases (%)	2019	Number of cases (%)
Lung cancer	3268 (29.67%)	Lung cancer	3774 (29.89%)	Lung cancer	4243 (30.4%)
Colorectal cancer	1352 (12.27%)	Colorectal cancer	1474 (11.67%)	Colorectal cancer	1696 (12.2%)
Liver cancer	1048 (9.51%)	Liver cancer	1212 (9.60%)	Liver cancer	1342 (9.6%)
Esophageal cancer	653 (5.93%)	Esophageal cancer	708 (5.61%)	Esophageal cancer	781 (5.6%)
Prostate cancer	541 (4.91%)	Prostate cancer	686 (5.43%)	Prostate cancer	779 (5.6%)
Gastric cancer	462 (4.19%)	Gastric cancer	601 (4.76%)	Gastric cancer	617 (4.4%)
Bladder cancer	339 (3.08%)	Nasopharynx cancer	438 (3.47%)	Thyroid cancer	501 (3.6%)
Nasopharynx cancer	318 (2.89%)	Thyroid cancer	427 (3.38%)	Lymphoma	401 (2.9%)
Thyroid cancer	305 (2.77%)	Bladder cancer	381 (3.02%)	Bladder cancer	381 (2.7%)
Lymphoma	283 (2.57%)	Lymphoma	352 (2.79%)	Nasopharynx cancer	374 (2.7%)
Kidney cancer	260 (2.36%)	Brain tumor (malignant)	259 (2.05%)	Kidney cancer	343 (2.5%)
Brain tumor (malignant)	250 (2.27%)	Kidney cancer	254 (2.01%)	Pancreatic cancer	288 (2.1%)
Pancreatic cancer	235 (2.13%)	Pancreatic cancer	241 (1.91%)	Leukemia	238 (1.7%)
Leukemia	198 (1.80%)	Leukemia	234 (1.85%)	Larynx cancer	210 (1.5%)
Larynx cancer	161 (1.46%)	Larynx cancer	212 (1.68%)	Brain tumor (malignant)	157 (1.1%)

Table 4: Type of malignant tumors in female from 2017 to 2019.

2017	Number of cases (%)	2018	Number of cases (%)	2019	Number of cases (%)
Breast cancer	1788 (19.16%)	Breast cancer	2226 (20.16%)	Breast cancer	2486 (19.4%)
Lung cancer	1526 (16.36%)	Lung cancer	1855 (16.80%)	Lung cancer	2379 (18.5%)
Thyroid cancer	904 (9.69%)	Thyroid cancer	1161 (10.51%)	Thyroid cancer	1438 (11.2%)
Colorectal cancer	871 (9.34%)	Cervical cancer	1119 (10.13%)	Cervical cancer	1193 (9.3%)
Cervical cancer	857 (9.19%)	Colorectal cancer	959 (8.68%)	Colorectal cancer	1128 (8.8%)
Ovarian cancer	299 (3.20%)	Ovarian cancer	372 (3.37%)	Ovarian cancer	434 (3.4%)
Liver cancer	242 (2.59%)	Liver cancer	292 (2.64%)	Liver cancer	353 (2.8%)
Brain tumor (malignant)	212 (2.27%)	Gastric cancer	217 (1.96%)	Lymphoma	266 (2.1%)
Lymphoma	210 (2.25%)	Lymphoma	209 (1.89%)	Gastric cancer	257 (2.0%)
Gastric cancer	178 (1.91%)	Brain tumor (malignant)	182 (1.65%)	Pancreatic cancer	202 (1.6%)
Leukemia	165 (1.77%)	Kidney cancer	171 (1.55%)	Kidney cancer	183 (1.4%)
Kidney cancer	150 (1.61%)	Leukemia	158 (1.43%)	Esophageal cancer	160 (1.2%)
Pancreatic cancer	144 (1.54%)	Esophageal cancer	156 (1.41%)	Leukemia	152 (1.2%)
Esophageal cancer	142 (1.52%)	Pancreatic cancer	156 (1.41%)	Nasopharynx cancer	131 (1.0%)
Nasopharynx cancer	132 (1.41%)	Nasopharynx cancer	147 (1.33%)	Brain tumor (malignant)	108 (0.8%)

Table 5A: Common characteristics of malignant tumors (2017-2018).

	2017			2018		
	Male / female	Median age	Metastasis (%)[a]	Male / female	Median age	Metastasis (%)[a]
Lung cancer	3268/1526	63	1489 (31.1)	3774/1855	64	2026 (36.0)
Colorectal cancer	1352/871	65	319 (14.3)	1474/959	64	363 (14.9)
Breast cancer	12/1788	50	137 (7.6)	17/2226	51	90 (4.0)
Liver cancer	1048/242	60	144 (11.2)	1212/292	57	140 (9.3)
Thyroid cancer	305/904	44	7 (0.6)	427/1161	46	11 (0.7)
Cervical cancer	0/857	50	33 (3.9)	0/1119	51	32 (2.9)
Esophageal cancer	653/142	66	43 (5.4)	708/156	66	42 (4.9)
Gastric cancer	462/178	63	61 (9.5)	601/217	62	111 (13.6)
Prostate cancer	541/0	74	189 (34.9)	686/0	74	218 (31.8)
Nasopharynx cancer	318/132	52	27 (6.0)	438/147	50	35 (6.0)
Kidney cancer	260/150	61	33 (8.0)	254/171	60	34 (8.0)
Bladder cancer	339/67	68	7 (1.7)	381/68	68	8 (1.8)
Pancreatic cancer	235/144	66	151 (39.8)	241/156	65	152 (38.3)
Ovarian cancer	0/299	52	77 (25.8)	0/372	52	142 (38.2)
Lymphoma	283/210	61	-	352/209	60	-
Leukemia	198/165	50	-	234/158	47	-

a: indicating invasion to adjacent organs or distant metastasis besides regional lymph nodes.

Table 5B: Common characteristics of malignant tumors (2019).

	2019				
	Male / female	Median age	Metastasis (%)[a]	Metastasis (male / female)	Median age of metastasis
Lung cancer	4243/2379	63	1882 (28.4)	1257/625	64
Colorectal cancer	1696/1128	64	443(15.7)	277/166	64
Breast cancer	28/2486	50	106 (4.2)	4/102	51
Liver cancer	1342/353	59	168(9.9)	125/43	61
Thyroid cancer	501/1438	41	11 (0.6)	7/4	63
Cervical cancer	0/1193	51	36(3.0)	0/36	51
Esophageal cancer	781/160	66	65 (6.9)	61/4	67
Gastric cancer	617/257	64	121(13.8)	91/30	66
Prostate cancer	779/0	74	243 (31.2)	243/0	75
Nasopharynx cancer	374/131	51	28(5.5)	20/8	52
Kidney cancer	343/183	61	56 (10.6)	36/20	63
Bladder cancer	381/86	68	17 (3.6)	17/0	75
Pancreatic cancer	288/202	65	215 (43.9)	127/88	65
Ovarian cancer	0/434	53	213 (49.1)	0/213	54
Lymphoma	401/266	59	-	-	-
Leukemia	238/152	45	-	-	-

a: indicating invasion to adjacent organs or distant metastasis besides regional lymph nodes

managing special medical insurance for tumors. During 2017-2019, 88.5% to 89.2% of the cases in data special medical insurance for malignant tumors were pathologically diagnosed ("gold standard"), showing a significant increase when comparing with the data in 2015 and 2016 [12]. It is suggested that the clinical methods for tumor diagnosis are improving gradually.

Special attention should be paid to the patients who have invasion and metastasis (including lymphatic metastasis) at the time of registration. Compared with patients with tumors at an early stage, those patients have poorer prognosis and treatment efficacy, resulting in heavy mental, life and economic burdens to the themselves, their families and the society. In 2017, there were 4568 patients with invasion and metastasis, accounting for 22.45%; in 2018, there were 7609 patients with that, accounting for 32.1%; in 2019, the number was increased to 12008 patients, accounting for 44.9%. Significant differences were found in the comparison of above number between any two years (P<0.05, Chi-square test). The reason may be related to

Table 6: Composition ratio of tumors.

Composition ratio	Lung cancer	Colorectal cancer	Breast cancer	Liver cancer	Cervical cancer	Esophageal cancer	Thyroid cancer	Gastric cancer
Special diseases in Chongqing in 2017	4794/20346 (23.6%)*	2223/20346 (10.9%)	1800/20346 (8.8%)*	1290/20346 (6.3%)*	857/20346 (4.2%)*	795/20346 (3.9%)*	1209/20346 (5.9%)*	640/20346 (3.1%)*
Special diseases in Chongqing in 2018	5629/23672 (23.8%)*	2433/23672 (10.3%)	2243/23672 (9.5%)*	1504/23672 (6.4%)*	1119/23672 (4.7%)*	864/23672 (3.6%)*	1588/23672 (6.7%)*	818/23672 (3.5%)*
Special diseases in Chongqing in 2019	6622/26765 (24.7%)*	2824/26765 (10.6%)	2514/26765 (9.4%)*	1695/26765 (6.3%)*	1193/26765 (4.5%)*	941/26765 (3.5%)*	1939/26765 (7.2%)*	874/26765 (3.3%)*
National data of onset in 2015	784/3929 (20.0%)	388/3929 (9.9%)	304/3929 (7.7%)	370/3929 (9.4%)	111/3929 (2.8%)	246/3929 (6.3%)	201/3929 (5.1%)	403/3929 (10.3%)

Note: Compared with the national data in 2015, *P<0.05.

the progress of imaging diagnosis, scope of surgery and pathological diagnosis. Despite these progresses, it is still worthy of our vigilance to control this number, which is a direct reflection of the effectiveness of early diagnosis and treatment of tumors.

In terms of age distribution, the data from 2017-2019 are consistent with those from 2015-2016 [12]. People at age of 60 years to 70 years old were the peak of malignant tumors treatment in both sexes. Figure 2 showed that the age distribution of malignant tumors treatment in men follows a normal distribution with 60 years to 70 years old as the midline. However, it is different in women (Figure 3), and the number of cases of 50 years to 60 years old, 40 years to 50 years old and 60 years to 70 years old are similar, possibly because the tumors (breast cancer, cervical cancer, thyroid cancer, and ovarian cancer) showing a high incidence in women have a younger age of onset. Therefore, screening for breast cancer, cervical cancer, and thyroid cancer in women at the age of 40 may contribute to early diagnosis and treatment.

In terms of type distribution, the top three malignant tumors were always lung cancer, colorectal cancer and breast cancer, which are consistent with that in data from 2015 to 2016 [12]. The above three tumors were also the most common malignant tumors in the world [13,14]. Additionally, thyroid cancer had gradually risen from the seventh place in 2015, the sixth in 2016 to the fifth in 2017 and the fourth in 2018 and 2019, indicating that thyroid cancer had an increasing incidence in Chongqing in recent years. Therefore, thyroid cancer requires increasing vigilance.

The top 4 male malignant tumors were lung cancer, colorectal cancer, liver cancer and esophageal cancer, which are consistent with the data from 2015 to 2016 [12]. However, the cases of prostate cancer increased from the sixth place in 2015 and 2016 to the fifth place at present.

The top five female malignant tumors were breast cancer, lung cancer, thyroid cancer, cervical cancer and colorectal cancer. Compared with data in 2015 and 2016, breast cancer showed top number in both databases, while the cases of thyroid cancer increased from the fifth to the third place, and the increase showed both in number and proportion [12].

Among the common malignant tumors, thyroid cancer showed the youngest age of treatment (41 years to 46 years old), and there were significantly more female patients with thyroid cancer than males, with a male-female ratio of about 1:3. In addition, the onset age of female-specific tumors such as breast cancer, cervical cancer and ovarian cancer is around 50 years old, which leads to a younger peak age of malignant tumors treatment in females than in males, as shown in Figure 3.

We have noted that various malignant tumors have a significant imbalance in male to female ratio, even after excluding sexual specific tumors such as breast cancer, cervical cancer, prostate cancer and ovarian cancer. For example, the male to female ratio of liver cancer was up to 5:1, thyroid cancer 1:3, esophageal cancer 4:1, bladder cancer 5:1, lung cancer 2:1, gastric cancer 5:2, nasopharynx cancer 5:2, and larynx cancer as high as 30-40:1. The cause for the pronounced gender differences is unclear yet, but it is the basis for targeted tumor screening for different genders.

Tumor invasion and metastasis often indicate poor prognosis of patients. Our data showed that pancreatic cancer has the highest invasion and metastasis rate, reaching 38.3% to 43.9%, followed by ovarian cancer (25.8% to 49.9%), lung cancer (31.1% to 36%) and prostate cancer (31.8% to 34.9%). Besides, over 10% of invasion and metastasis rates were also showed in colorectal cancer, liver cancer, and gastric cancer. Early diagnosis and treatment for these metastasis-prone cancers is of significant importance to improve the prognosis. Thyroid cancer had the lowest metastasis rate, only 0.6% to 0.7%, followed by bladder cancer (1.7% to 1.8%).

We compared the data of special medical insurance for malignant tumors in Chongqing (main urban area) from 2017 to 2019 with the national data of malignant tumors in 2015 [15,16]. The composition ratios of tumors were found to be very different, showing in the ratios of almost all common malignant tumors, indicating that the malignant tumor spectrum in Chongqing (main urban area) had its own characteristics. The composition ratios of gastric cancer, esophageal cancer and liver cancer in data of Chongqing were significantly lower than those of the national data, while the ratios of lung cancer, breast cancer and cervical cancer in Chongqing were significantly higher than those of national data. These differences are theoretical basis for the program development in terms of cancer prevention and treatment in Chongqing. Some differences in composition ratios of tumors were showing when comparing the data in 2019 with those in 2017 and 2018 in Chongqing (main urban area), such as an increase in the composition ratio of thyroid cancer. Therefore, it is necessary to report the city data of malignant tumors every year, so as to understand the change trend of tumor spectrum and to revise the prevention and treatment plan correspondingly.

At last, it is expected that the regular release of data is conducive to the development of early diagnosis and treatment plan for malignant tumors in Chongqing, thereby serving the citizens.

Funding

2019 Decision Consultation and Management Innovation Project, Shapingba District, Chongqing (Jcd201954 and Jcd201957). ChongQing Science and Health Joint medical research project, 2021MSXM309.

References

1. Torre LA, Bray F, Siegel RL, Ferlay J, Tieulent JL, Jemal A. Global cancer statistics,

2012. CA Cancer J Clin. 2015;65(2):87-108.

2. Liu Y, Liu J, Yin P, Liu S, Cai Y, You J, et al. The disease burden of malignant tumor in China, 1990 and 2010. Zhonghua Yu Fang Yi Xue Za Zhi. 2015;49(4):309-14.

3. Cao M, Chen W. Epidemiology of lung cancer in China. Thorac Cancer. 2019;10(1):3-7.

4. Chen W, Zheng R, Baade PD, Zhang S, Zeng H, Bray F, et al. Cancer statistics in China, 2015. CA Cancer J Clin. 2016;66(2):115-32.

5. Jemal A, Center MM, DeSantis C, Ward EM. Global patterns of cancer incidence and mortality rates and trends. Cancer Epidemiol Biomarkers Prev. 2010;19(8):1893-907.

6. Kim N. Chemoprevention of gastric cancer by helicobacter pylori eradication and its underlying mechanism. J Gastroenterol Hepatol. 2019;34(8):1287-95.

7. Boulch DM, de Martel C, Franceschi S, Plummer M. Fraction and incidence of liver cancer attributable to hepatitis B and C viruses worldwide. Int J Cancer. 2018;142(12):2471-7.

8. Hu Z, Ma D. The precision prevention and therapy of HPV-related cervical cancer: new concepts and clinical implications. Cancer Med. 2018;7(10):5217-36.

9. Han L. Cancer prevention and treatment is a top priority in building a healthy China. Chinese Med Guide. 2019;16(8):7-8 (in chinese).

10. Bin DX, Yan LX, Qiang MD, et al. Analysis on incidence and mortality of malignant tumors in chongqing in 2015. Prevention and control of chronic diseases in China. 2017;25(1):73-7 (in chinese).

11. Qiang WW, Jie H. Reflection on tumor registration in China under the background of big data informatization. Chinese J Oncol. 2019;41(1):15-8 (in chinese).

12. Miao H, Feng CX, Gang C, et al. Analysis on the data of special medical insurance management for malignant tumor in CHONGQING in 2015-2016. Medical Recapitulate. 2017;23(23):4762-6 (in chinese).

13. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, et al. Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. Int J Cancer. 2015;136(5):E359-86.

14. Ferlay J, Colombet M, Soerjomataram I, Dyba T, Randi G, Bettio M, et al. Cancer incidence and mortality patterns in Europe: estimates for 40 countries and 25 major cancers in 2018. Eur J Cancer. 2018;103:356-87.

15. Chen W, Sun K, Zheng R, Zeng H, Zhang S, Xia C, et al. Cancer incidence and mortality in China, 2014. Chin J Cancer Res. 2018;30(1):1-12.

16. Shou ZR, Xin SK, Wei ZS. Analysis of the prevalence of malignant tumors in China in 2015. Chinese J Oncol. 2019;41(1):19-28 (in Chinese).