The analysis of characteristics of 1624 soft tissue sarcoma cases in 2006~2016 in Henan Province Cancer Hospital, China

Peng Zhang (heartnesszp@126.com)
Henan Cancer Hospital
Jinyan Liu
Henan Cancer Hospital
Feifei Feng
Zhengzhou University
Qiao Zhang
Zhengzhou University
Guangcai Duan
Zhengzhou University
Weitao Yao
Henan Cancer Hospital

Research article

Keywords: Soft tissue sarcoma; Incidence characteristics; Henan; China

Posted Date: September 6th, 2019

DOI: https://doi.org/10.21203/rs.2.14006/v1

Abstract

Background To analyze the incidence characteristics of 1624 inpatients with soft tissue sarcoma (STS) during 2006 to 2016 in Henan Province Cancer Hospital.

Methods The information of electronic medical record from the first hospitalized patients with STS in Henan Province Cancer Hospital during January 1, 2006 to December 31, 2016 was collected, and descriptive statistics was analyzed on age, gender and pathological type by using SPSS21.0 software.

Results There were 1624 inpatients with STS in Henan Province Cancer Hospital in 2006~2016.The top nine pathological subtypes of STS with high constituent ratio were undifferentiated pleomorphic sarcoma (UPS,23.83%),synovial sarcoma(16.69%), liposarcoma(13.67%), fibrosarcoma(10.22%), sarcoma without definite type (8.99%), leiomyosarcoma(7.02%), dermatofibrosarcoma protuberant (5.79%),rhabdomyosarcoma (4.68%) and malignant peripheral nerve sheath tumor(4.25%). The average age of inpatients was 44.71±17.91, and the inpatients aged 35-59 accounted for 47.6%.The number of UPS inpatients reached the peak at the age of 55 to 64; The proportion of rhabdomyosarcoma between 0~4 and 5~9 years old can reach above 46%.In total 1624 inpatients of STS, the number of male and female inpatients were 923 and 701, respectively. The gender ratio was 1.32:1. The proportion of UPS in either male or female inpatients was the highest, accounting for 23.10% and 24.80%, respectively. The number of male inpatients was more than that of female in the top nine pathological subtypes of STS except leiomyosarcoma (the gender ratio was 0.84:1).

Conclusion The top three pathological subtypes of STS with high constituent ratio were UPS, synovial sarcoma and liposarcoma.UPS should be paid more attention on the prevention, treatment and research in Henan in future for its highest proportion of STS.

Background

Soft tissue sarcomas (STSs) are rare malignant tumors of mesenchymal origin with high aggressiveness and heterogeneity. More than 50% histopathological subtypes have been identified, and may occur in any part of body[1]. STSs are usually derived from bone supporting structures, including muscle, fascia, fiber, nerve sheath, fat, lymphoid tissue and blood vessel. STS is account for approximately 0.8% of adult malignant tumor[2] and 5%–7% of children cancers[3], and the study from Japan and England shows that the incidence of soft tissue sarcoma in childhood cancer (aged 0–14) is on the rise [4]. There are good published literatures on the incidence of STS in the western populations, but there is a paucity of data from Asia, particularly on the epidemiology [5, 6].It deserves our extensive research due to it is highly hazardous to people for its high invasiveness, recurrence and metastasis.

The data of inpatients with malignant tumors are used to study the pathological subtype proportion and demographic characteristics. Dynamic analysis is carried out to explore the trend of the epidemiology of malignant tumors so as to point out the focus and direction of future work and provide reference for the prevention and treatment of malignant tumors. The epidemiological characteristics of STS have been reported in many literatures both inside and outside the country. In 2018, there were 13040 newly diagnosed STS including the heart site in the United States according to the latest research data released by the American Cancer Society, which included 7,370 male and 5,670 female inpatients, and the sex ratio between males and females was 1.30:1.Moreover, 5150 cases of STS died in the United States in 2018, including 2770 males and 2380 females[2]. Lei Y[7] et al. found that there were 2048 cases of STS diagnosed in Beijing in the past 15 years, with an incidence rate of 1.15/100,000 according to the population-based STS data collected by the Beijing Cancer Registry from 1999 to 2013. The incidence rate of China's population standardization and the world population standardization rate were 0.74/100,000 and 0.86/100,000 respectively. In addition, it was found that the incidence and the common pathological types of STS in Beijing and Taiwan[8] were not the same. However, the characteristics of STS in Henan Province, the north middle of China, have not been reported up to now.

This study was to conduct an epidemiological analysis of the incidence characteristic of STS inpatients for the first time in Henan Province Cancer Hospital during January 1, 2006 to December 31, 2016. According to the Henan Province Cancer Prevention Office, the STS patients treated in Henan Province Cancer Hospital is account for about 75% of the province, therefore, analyzing the composition of the age, gender, pathological type of patients with STS in Henan Province Cancer Hospital during the 11 years would provide an reference of the epidemiological statue and time trend of patients with STS in Henan province, and provide clues for the health administrative department to develop effective prevention and control measures for STS.

Subjects And Methods

2.1 Subjects

The hospitalized patients with STS for the first time in Henan Province Cancer Hospital during January 1, 2006 to December 31, 2016 were included. The tumor classification criteria were based on the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD–10), C47 and C49 in ICD–10 were regarded as inclusion criteria for STS. C47 was a peripheral and autonomic nervous

system malignancy, and C49 was other connective tissue and soft tissue malignant tumors. The classification criterion for histopathological types was ICD-O–2. Patients with recurrence, incomplete data, non-hospital or visceral STS, such as gastrointestinal stromal tumors and uterine leiomyosarcoma, were excluded in the research. The study was approved by the ethical committee of Zhengzhou University, and all the participating patients signed the informed consent.

2.2 Data Source and Collection

The information of electronic medical record of the inpatients with STS meeting the inclusion criteria in Henan Province Cancer Hospital was collected, including admission number (AD), age, gender, date of birth, place of birth, date of admission, date of discharge, location of tumor and pathological subtypes. Certainly, privacy information of the inpatients was not involved. The basic information of electronic medical records was input and stored in Microsoft Excel.

2.3 Data Processing and Statistical Analysis

In the latest STS WHO classification (2013 edition), the malignant fibrous histiocytoma (MFH) was renamed undifferentiated pleomorphic sarcoma (UPS). In this study, the cases with pathological diagnosis of MFH before 2013 or UPS after 2013 were uniformly named UPS in order to facilitate statistics.

The inpatients were divided into groups of 5 years old, a total of 18 groups. SPSS21.0 software was used to descriptively analyze the age, sex and pathological types of inpatients with STS. And the ratio of different pathological types was calculated respectively. Microsoft Excel was used to make graphs.

2.4 Quality Control

The investigators need to clarify the purpose and significance, and clarify the items and precautions of the research before collecting information. The investigators and the staffs of the medical record department jointly checked and confirmed the information of the original inpatient meeting the inclusion criteria to ensure accurate and completed data.

Results

3.1 General situation of inpatients with STS in Henan Province Cancer Hospital

A total of 1624 inpatients with STS in Henan Province Cancer Hospital from 2006 to 2016 were included, and the male and female inpatients were 923 and 701, respectively. The gender ratio was 1.32:1.The overall number of inpatients showed a significant growth trend before 2010, which decreased slightly in 2011 and increased from 2011 to 2013. Then the total number of inpatients decreased slightly from 2013 to 2014 and increased again after 2014.The number of male inpatients were more than female inpatients in all most every year from 2006 to 2016 except 2014 (As shown in Table 1 and Figure 1).

The top nine pathological subtypes of STS with high constituent ratio were UPS (23.83%), synovial sarcoma (16.69%), liposarcoma (13.67%), fibrosarcoma (10.22%), Sarcoma without definite type (8.99%), leiomyosarcoma (7.02%), dermatofibrosarcoma protuberant (5.79%), rhabdomyosarcoma (4.68%) and malignant peripheral nerve sheath tumor (4.25%), accounting for 95.15% of total number of inpatients with STS in Henan Province Cancer Hospital (As shown in the Table 2).

3.2 Age distribution of inpatients with STS in Henan Province Cancer Hospital

3.2.1 General Condition

Inpatient age with STS in Henan Province Cancer Hospital from 2006 to 2016 distributed over a wide range (1–82 yr), with an average age of 44.71±17.91. The number of inpatients with STS increased significantly since the age of 15, reached the peak at the age of 45–59, and decreased rapidly after 75 years old. The results showed a single peak distribution. The median age of inpatients with STS was 46 years old, and the inpatients at the age of 35–59 accounted for 47.6% (As shown in Figure 2).

3.2.2 The age distribution of inpatients with STS in Henan Province Cancer Hospital

From 2006 to 2016, the median age of inpatients with STS in Henan Province Cancer Hospital was delayed from 43 years old in 2006 to 51 years old in 2016, with the median age of inpatients in 2014 and 2016 being the largest. It was 51 years old.

The analysis showed that the median age of inpatients with STS of the top nine pathological types varied from 2006 to 2016. It was found that the median age of some inpatients with STS showed different degrees of delay. For instance, the median age of inpatients with UPS, fibrosarcoma and leiomyosarcoma was delayed 10, 8.5 and 17 years old, respectively. By contrast, the median age of inpatients with some pathological subtypes of STS had a tendency to move forward such as malignant peripheral nerve sheath tumor, which was brought forward by about 10 years old. While the median age of rhabdomyosarcoma was less than 22 years old for containing embryonal rhabdomyosarcoma, which was more common in newborn (As shown in Table 3).

3.2.3 The variation trend of the composition ratio of STS subtypes in all age groups in Henan Province Cancer Hospital

From 2006 to 2016, the composition ratio of STS subtypes of different age groups had a certain distribution pattern. For example, the inpatients with UPS and liposarcoma increased with age, and their tumor composition ratio increased continuously. The tumor composition ratio of UPS in the 70–74 age group increased by 20.77% compared with the 0–4 age group, and the tumors proportion of liposarcoma in the 80–85 age group increased by 30.15% compared with the 15–19 age group. Rhabdomyosarcoma accounted for an increasing proportion of tumors with the decrease of age, and the proportion of tumors in 0–4 age group and 5–9 age group can reach more than 46%. Synovial sarcoma was the most common component in the age group of 15–39 with a typical fusiform distribution. Other subtypes of STS composition ratio changes were not significant (As shown in Table 4 and Figure 3).

3.3 Gender distribution of inpatients with STS in Henan Province Cancer Hospital

3.3.1 General Condition

From 2006 to 2016, 923 men and 701 women were hospitalized with STS in Henan Province Cancer Hospital. The male-female ratio was 1.32:1. UPS, accounting for 23% of STS, was the most common pathological type in males, followed by synovial sarcoma, liposarcoma and fibrosarcoma, accounting for 15%, 15% and 11% in males, respectively. Similar results were shown in females. The most common type was UPS accounting for 24.80% in females, followed by synovial sarcoma, liposarcoma and sarcoma without definite type, accounting for 18%, 13% and 9% in females, respectively. As shown in Figure 4.

3.3.2 Gender differences in common pathological subtypes of inpatients with STS in Henan Province Cancer Hospital

Males were significantly more susceptible to STS except for leiomyosarcoma among the top nine pathological subtypes of STS in Henan Province Cancer Hospital from 2006 to 2016.UPS was found in 213 males and 174 females, accourting for 13.12% and 10.71% of all inpatients with STS, respectively. Leiomyosarcoma was found in 213 males and 174 females, accourting for 13.12% and 10.71% of all inpatients with STS, respectively. Malignant peripheral nerve sheath tumor was the most prominent sex-specific subtype with male-to-female ratio was 2:1, followed by dermatofibrosarcoma (1.69:1), fibrosarcoma (1.63:1), rhabdomyosarcoma (1.6:1) and leiomyosarcoma (0.84:1).As shown in Table 5.

Discussion

The study analyzed the characteristics of 1624 inpatients with STS excluding visceral sarcoma from Henan Province Cancer Hospital from 2006 to 2016. We found that the top nine were UPS (accounting for 23.83% all STS), synovial sarcoma (16.69%), liposarcoma (13.67%), fibrosarcoma, sarcoma without definite type, leiomyosarcoma, dermatofibrosarcoma protuberant, rhabdomyosarcoma, and malignant peripheral nerve sheath tumor. The number of inpatients with STS in the first three pathological types accounted for 54.19% of all the inpatients with STS in Henan Province Cancer Hospital. The first three pathological types of over 45 years old STS inpatients in Beijing were UPS(19.22%), liposarcoma (19.04%) and malignant peripheral nerve sheath tumor (10.18%)[7], the first three pathological subtypes of STSs in Taiwan were liposarcoma(23%), UPS(18.9%) and leiomyosarcoma(7.6%)[8],and the first three pathological types of STSs in Japan were UPS(19.46%), well differentiated liposarcoma(19.23%), myxoid/round cell liposarcoma (9.35%)[9].Three results were different from ours. By contrast, Fang's[10] research was consistent with ours. He analyzed information of 1118 patients with STS, and found that the most common first three pathological types were

UPS(35.24%), synovial sarcoma (17.08%) and liposarcoma (16.28%).We speculated that the difference may be due to different data collection methods, because the research in Beijing, Taiwan and Japan was population-based incidence data, and the analysis of STS in Beijing was divided into three age groups: 0–14 years old, 15~44 years old and over 45 years old, in which the first three pathological types were analyzed in the group of over 45 years old. Particularly, It was noteworthy that synovial sarcoma was the most common diagnosis in foot and ankle malignant soft tissue tumors[11].

Previous studies have shown that the median age of inpatients with STS was 59 years old[12]. The study showed that the average age of inpatients with STS in Henan Province Cancer Hospital was 44.71±17.91 years old, and the peak age of onset was 40–59 years old. Morever, the median age of inpatients with STS has been postponed from 43 years old in 2006 to 51 years old in 2016, which may be related to population aging. However, the peak age of STS in Beijing was 80–84 years old[7], which may be related to the grouping method. The lower peak age in the study may be related to it including embryonal rhabdomyosarcoma with the lower age of onset. The peak age of STS of the extremities in Korea from 2009 to 2011 was 70–89 years old[13], and the peak age of STS in Ireland from 1994 to 2012 was 70–84 years old[14], which were different from the results of the study. The reason may be that the result in Korea mainly studies STS of the extremities, but not the whole body (excluding visceral sarcoma), and the research in Ireland was about the whole body including visceral sarcoma. While in our study, we mainly analyze whole body STS, visceral sarcoma excluded.

We found that the median age of inpatients with UPS was delayed by 10 years old by analyzing the proportion in the first nine pathology subtypes during the period of 2006 to 2016, and UPS accounted for almost 35% of all inpatients with STS at the age of over 55, which suggested that the important age boundary of UPS was 55 years old. In addition, the present study and published studies manifested that synovial sarcoma was more frequently diagnosed in young patients over 15 years old, which was associated with the comliex nature of synovial sarcoma[15, 16]. Meanwhile, we speculated that onset age of malignant peripheral nerve sheath tumor tend to be younger according to the median age of inpatients with malignant peripheral nerve sheath tumor was about 10 years old younger in the study, therefore, we can further speculate that the incidence of malignant nerve sheath tumor with neurofibromatosis type 1 (NF1) may be higher in all subtypes in the future, because the age of onset of NF1was younger[17, 18]. Rhabdomyosarcoma was the most common subtype of STS under the age of 20, accounting for 36.67%.The high incidence of different pathological subtypes in all age groups suggested that we need to explore it's possible risk factors in future studies.

We analyzed the gender distribution of STS in Henan Province Cancer Hospital from 2006 to 2016, and found that among 1624 inpatients including 923 males and 701 females, and the ratio of male to female was 1.32:1.Lei Y[7] et al found that the incidence of STS of males in Beijing was higher than that of females, and the incidence rate of both males and females was 1.38:1 on the basis of population-based STS data from 1999 to 2013 collected by the Beijing Cancer Registry. The result was similar with Taiwan, where the gender ratio was 1.34:1[8]. These were similar to the situation in Henan province. However, the STS surveillance data from 27 countries in Europe showed that the female incidence rate was 5.0/100,000, the male incidence rate was 4.4/100,000, and the female was slightly higher than the male[19]. We hypothesized that the reason was that they included data on internal organs. The incidence of uterine leiomyosarcoma and mammary sarcoma in women was significantly higher than that of epididymis sarcoma in male, and the visceral sarcoma data was included in this study, so the incidence of STS in women was higher. In contrast, visceral sarcoma was not included in the study.

In short, we analyzed the sex, age, pathological subtypes of STS and their change trends in 1624 inpatients with soft tissue sarcomas (excluding visceral organs) from Henan Province Cancer Hospital from 2006 to 2016 in the study. We have a clearer understanding of the basic situation and epidemiological trends of STS in Henan province represented by Henan Province Cancer Hospital, and point out the direction for the prevention and treatment of STS in the future.

Abbreviations

STS: soft tissue sarcoma; ICD–10: the International Statistical Classification of Diseases and Related Health Problems;AD: admission number; MFH: malignant fibrous histiocytoma; UPS: undifferentiated pleomorphic sarcoma; NF1: neurofibromatosis type 1

Declarations

Ethics approval and consent to participate.

The study and the protocol were approved by the ethical committee of Zhengzhou University.

Consent for publication

Not applicable.

Availability of data and materials

The data is available and the corresponding author should be contacted for inquiries.

Competing interests

The authors declare that they have no competing interests..

Funding

This study was financially supported by the grant from Henan Department of Science and Technology, China (No. 162102310319) and the grant of Medical Science Research Foundation of Henan Province (No. 2018020477).

Authors' contributions

Peng Zhang and Jinyan Liu joined in the literature search and wrote the review manuscript. Feifei Feng provided expert feedback and performed statistical analysis. Qiao Zhang, Guangcai Duan, Weitao Yao extracted relevant clinical data, All authors have read and approved the final manuscript.

Acknowledgements

Not applicable.

References

1. Vodanovich DA, PF MC: **Soft-tissue Sarcomas**. *Indian J Orthop* 2018, **52**(1):35-44.
2. Siegel RL, Miller KD, Jemal A: **Cancer statistics, 2018**. *CA: a cancer journal for clinicians* 2018, **68**(1):7-30.
3. Yang L, Yuan Y, Sun T, Li H, Wang N: **Characteristics and trends in incidence of childhood cancer in Beijing, China, 2000-2009**. *Chin J Cancer Res* 2014, **26**(3):285-292.
4. Nakata K, Ito Y, Magadi W, Bonaventure A, Stiller CA, Katanoda K, Matsuda T, Miyashiro I, Pritchard-Jones K, Rachet B: **Childhood cancer incidence and survival in Japan and England: A population-based study (1993-2010)**. *Cancer Science* 2018, **109**(2):422-434.
5. Poon E, Quek R: **Soft tissue sarcoma in Asia**. *Chin Clin Oncol* 2018, **7**(4):46.
6. Ngan R, Wang E, Porter D, Desai J, Prayogo N, Devi B, Quek R: **Soft-tissue sarcomas in the Asia-Pacific region: a systematic review**. *Asian Pac J Cancer Prev* 2013, **14**(11):6821-6832.
7. Yang L, Fang Z, Fan Z, Wang N, Yuan. Y: **An analysis of incidence trends and characteristics of soft tissue sarcoma in Beijing, 1999-2013.** *Chin J oncol* June 2017, **39**:471-476.
8. Hung GY, Yen CC, Horng JL, Liu CY, Chen WM, Chen TH, Liu CL: **Incidences of Primary Soft Tissue Sarcoma Diagnosed on Extremities and Trunk Wall: A Population-Based Study in Taiwan**. *Medicine (Baltimore)* 2015, **94**(41):e1696.
9. Ogura K, Higashi T, Kawai A: **Statistics of soft-tissue sarcoma in Japan: Report from the Bone and Soft Tissue Tumor Registry in Japan**. *Journal of Orthopaedic Science* 2017, **22**(4):755-764.
10. Fang ZW, Chen J, Teng S, Chen Y, Xue RF: **Analysis of soft tissue sarcomas in 1118 cases.** *Chin Med J (Engl)* Jan 2009, **122**(1):51-53.
11. Zhang XX, Xu LB, Xu XF, Zhao ZG, Liu T, Zhang SG, Yu SJ: **Analysis of clinicopathological characteristics and prognostic factors of foot and ankle soft tissue and bone tumors**. *Zhonghua Zhong Liu Za Zhi* 2018, **40**(9):685-689.
12. Lahat G, Lazar A, Lev D: **Sarcoma Epidemiology and Etiology: Potential Environmental and Genetic Factors.** *Surgical Clinics of North America* June 2008, **88**(3):451-481.
13. Kang S, Kim HS, Choi ES, Han I: **Incidence and Treatment Pattern of Extremity Soft Tissue Sarcoma in Korea, 2009-2011: A Nationwide Study Based on the Health Insurance Review and Assessment Service Database**. *Cancer Res Treat* 2015, **47**(4):575-582.
14. Bhatt N, Deady S, Gillis A, Bertuzzi A, Fabre A, Heffernan E, Gillham C, O'Toole G, Ridgway PF: **Epidemiological study of soft-tissue sarcomas in Ireland**. *Cancer Med* 2016, **5**(1):129-135.
15. Murphey MD, Gibson MS, Jennings BT, Crespo-Rodriguez AM, Fanburg-Smith J, Gajewski DA: **From the archives of the AFIP: Imaging of synovial sarcoma with radiologic-pathologic correlation**. *Radiographics* 2006, **26**(5):1543-1565.

16. Wang S, Song R, Sun T, Hou B, Hong G, Mallampati S, Sun H, Zhou X, Zhou C, Zhang H *et al*: **Survival changes in Patients with Synovial Sarcoma, 1983-2012**. *J Cancer* 2017, **8**(10):1759-1768.
17. Ducatman BS, Scheithauer BW, Piepgras DG, Reiman HM, Ilstrup DM: **Malignant peripheral nerve sheath tumors. A clinicopathologic study of 120 cases**. *Cancer* 1986, **57**(10):2006-2021.
18. Kolberg M, Holand M, Agesen TH, Brekke HR, Liestol K, Hall KS, Mertens F, Picci P, Smeland S, Lothe RA: **Survival meta-analyses for >1800 malignant peripheral nerve sheath tumor patients with and without neurofibromatosis type 1**. *Neuro Oncol* 2013, **15**(2):135-147.
19. Stiller CA, Trama A, Serraino D, Rossi S, Navarro C: **Descriptive epidemiology of sarcomas in Europe: Report from the RARECARE project.** *EJC* Feb 2013, **49**(3):684-695.

Tables

Table 1 The number of inpatients with STS in Henan Province Cancer Hospital in 2006~2016

Year	Male	Female	Total
2006	50	39	89
2007	56	42	98
2008	81	44	125
2009	87	65	152
2010	97	76	173
2011	87	66	153
2012	101	57	158
2013	113	70	183
2014	68	72	140
2015	90	85	175
2016	93	85	178

Table 2 The number and percentage of inpatients with different pathological subtypes of STS in Henan Province Cancer Hospital in 2006~2016

Rank	Pathological name of STS	N	Percentage (%)
1	Undifferentiated pleomorphic sarcoma	387	23.83
2	Synovial sarcoma	271	16.69
3	Liposarcoma	222	13.67
4	Fibrosarcoma	166	10.22
5	Sarcoma without definite type	146	8.99
6	Leiomyosarcoma	114	7.02
7	Dermatofibrosarcoma protuberant	94	5.79
8	Rhabdomyosarcoma	76	4.68
9	Malignant peripheral nerve sheath tumor	69	4.25
10	Ewing's sarcoma	19	1.17
11	Epithelioid sarcoma	16	0.98
12	Angiosarcoma	13	0.80
13	Clear cell sarcoma	11	0.68
14	Alveolar soft part sarcoma	7	0.43
15	Neurofibrosarcoma	5	0.31
16	Small cell sarcoma	3	0.18
17	Kaposi's sarcoma	3	0.18
18	Giant cell sarcoma	2	0.12
	Total	1624	100

Table 3 The median age of patients with the top nine rank of pathological subtypes of STS in Henan Province Cancer Hospital in 2006~2016 (year)

Pathological subtypes	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Undifferentiated pleomorphic sarcoma	43.50	50.50	52.50	55.00	51.00	55.00	56.00	54.00	58.50	55.00	53.50
Synovial sarcoma	40.00	40.00	40.00	36.00	39.00	34.00	32.50	35.00	35.50	30.50	41.00
Liposarcoma	52.50	51.00	48.00	47.00	45.50	53.00	43.50	46.00	51.00	49.00	52.00
Fibrosarcoma	43.00	41.50	40.50	51.00	43.50	42.00	41.00	48.50	49.00	44.00	51.50
Sarcoma without definite type	50.00	43.50	52.00	55.00	52.00	56.00	59.00	51.50	58.00	50.00	48.50
Leiomyosarcoma	42.00	44.00	45.00	42.00	48.50	50.00	55.00	47.00	60.00	54.00	59.00
Dermatofibrosarcoma protuberant	51.00	33.00	37.50	38.00	33.00	36.00	52.00	39.00	32.00	34.00	50.00
Rhabdomyosarcoma	18.00	8.00	22.00	20.50	16.50	21.00	16.00	19.50	13.00	18.00	9.50
Malignant neurilemmoma	58.00	51.00	40.00	59.00	49.00	50.50	40.50	40.00	45.00	50.50	48.00

Table 4 The constituent ratio of inpatients with different pathological subtypes of STS in different age groups in Henan Province Cancer Hospital in 2006~2016 (%)

Age	UPS	Synovial sarcoma	Liposarcoma	Fibrosarcoma	Sarcoma without definite type	Leiomyosarcoma	Dermatofibrosarcoma protuberant	Rhabdomyo sarcoma	Malignant neurilemmoma	Other rare pathological types of sarcoma
0~	26.67	6.67	0.00	0.00	0.00	6.67	0.00	46.67	0.00	13.33
5~	15.79	15.79	0.00	2.63	2.63	2.63	2.63	47.37	2.63	7.89
10~	18.52	11.11	0.00	3.70	7.41	3.70	11.11	29.63	0.00	14.81
15~	20.00	28.57	1.43	5.71	5.71	0.00	4.29	24.29	2.86	7.14
20~	10.58	34.62	6.73	12.50	8.65	3.85	10.58	4.81	0.96	6.73
25~	19.61	31.37	9.80	10.78	6.86	0.00	8.82	2.94	4.90	4.90
30~	13.01	27.64	9.76	11.38	6.50	8.94	13.82	0.00	4.07	4.88
35~	17.73	14.18	14.18	15.60	8.51	9.93	7.09	0.00	4.26	8.51
40~	19.58	23.78	18.88	12.59	4.20	5.59	4.20	2.10	4.90	4.20
50~	23.93	11.66	19.63	11.04	12.27	7.98	6.75	1.23	2.45	3.07
55~	33.33	9.88	13.58	8.64	11.11	11.73	4.94	1.23	3.09	2.47
60~	33.10	14.08	14.79	6.34	11.27	8.45	1.41	2.11	7.04	1.41
65~	32.35	5.88	16.67	10.78	11.76	6.86	1.96	2.94	7.84	2.94
70~	47.44	5.13	6.41	11.54	11.54	6.41	1.28	1.28	6.41	2.56
75~	35.71	3.57	25.00	7.14	14.29	10.71	0.00	0.00	3.57	0.00
80~	26.32	0.00	31.58	10.53	15.79	0.00	0.00	5.26	5.26	5.26
85~	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note: The pathological subtypes of STS with quite low incidence are called by a joint name “Other rare pathological types of STS”, including Ewing's sarcoma, Epithelioid sarcoma, Angiosarcoma, Clear cell sarcoma, Alveolar soft part sarcoma, Neurofibrosarcoma, Small cell sarcoma, Kaposi's sarcoma, Giant cell sarcoma.

Table 5 The Gender distribution characteristic of inpatients with the top nine rank of pathological subtypes of STS in Henan Province Cancer Hospital in 2006~2016

Pathological subtypes	Male		Female		The ratio of male to female
	N	Percentage (%)	N	Percentage (%)	
Undifferentiated pleomorphic sarcoma	213	13.12	174	10.71	1.22 : 1
Synovial sarcoma	143	8.81	128	7.88	1.12 : 1
Liposarcoma	135	8.31	87	5.35	1.55: 1
Fibrosarcoma	103	6.34	63	3.87	1.63 : 1
Sarcoma without definite type	82	5.04	64	3.94	1.28 : 1
Leiomyosarcoma	52	3.63	62	3.81	0.84 : 1
Dermatofibrosarcoma protuberant	59	3.20	35	2.16	1.69: 1
Rhabdomyosarcoma	47	2.89	29	1.78	1.60 : 1
Malignant neurilemmoma	46	2.83	23	1.42	2.00 : 1

Figures

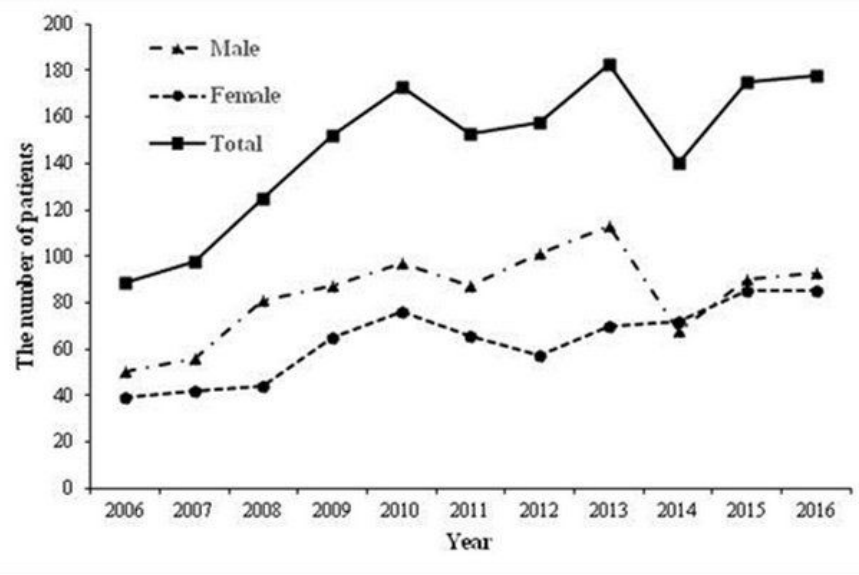

Figure 1

The trend of inpatients with STS in Henan Province Cancer Hospital in 2006~2016

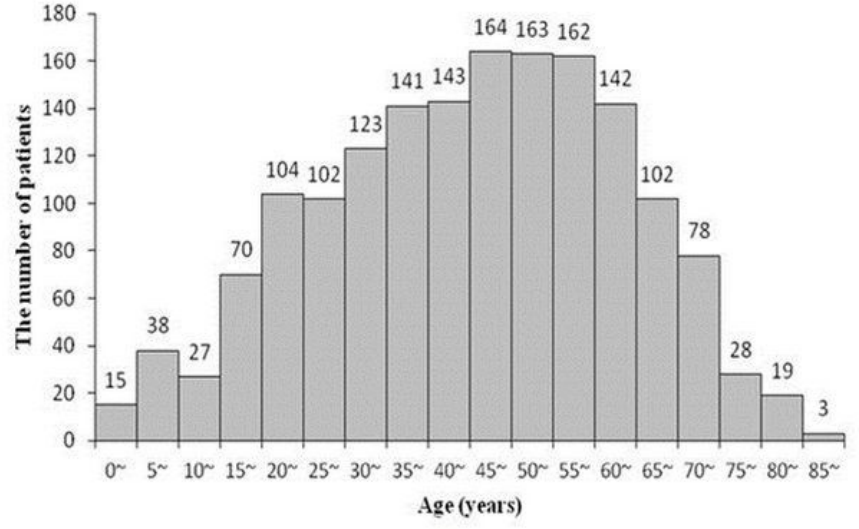

Figure 2

The number of inpatients of STS in different age groups in Henan Province Cancer Hospital in 2006~2016

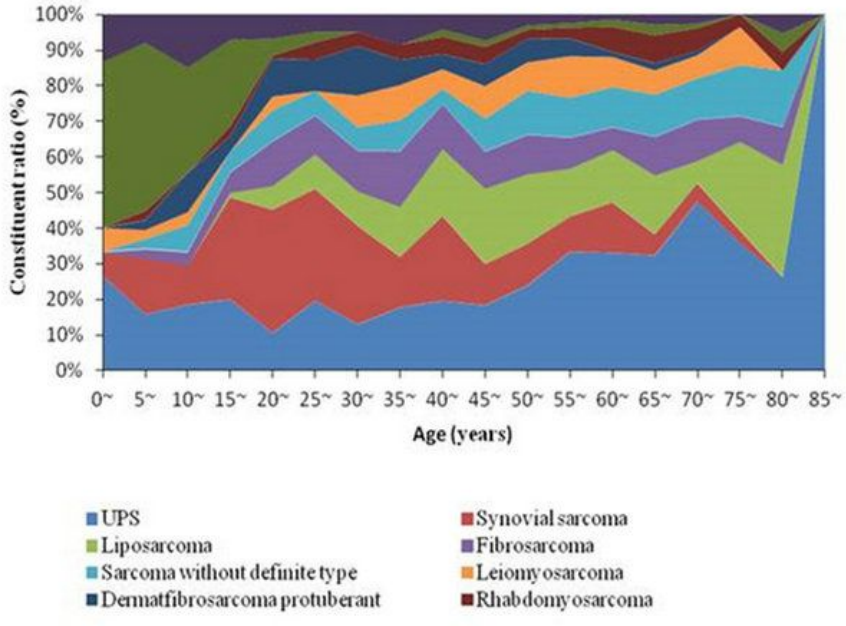

Figure 3

The constituent ratio of inpatients with different pathological subtypes of STS in different age groups in Henan Province Cancer Hospital in 2006~2016 (%)

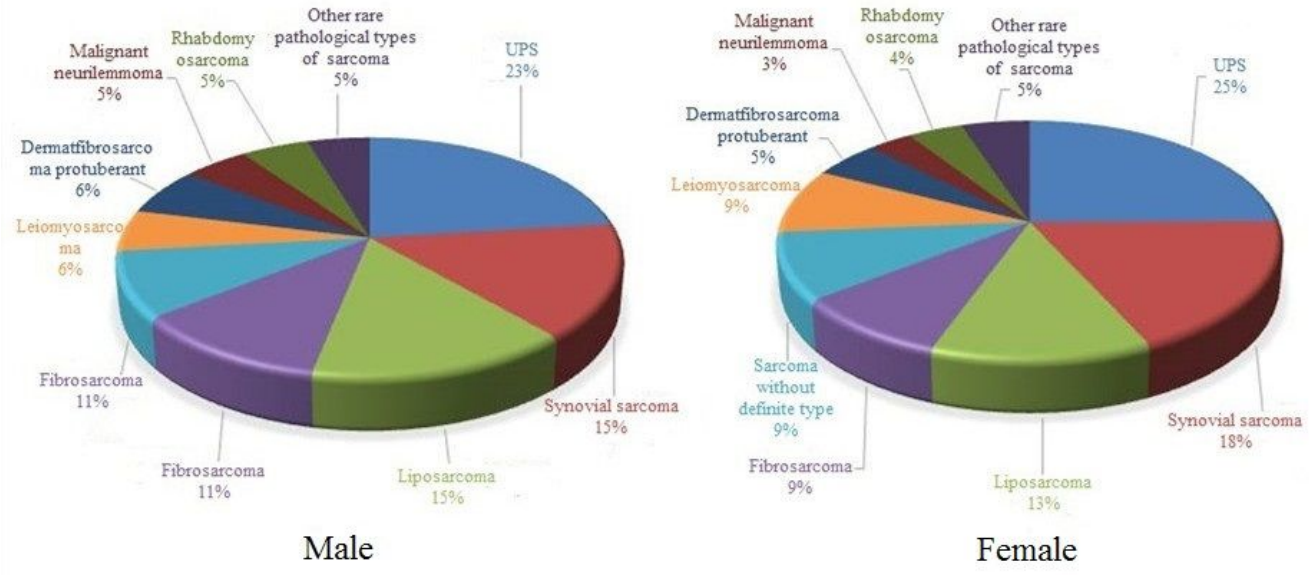

Figure 4

The percentage of inpatients with different pathological subtypes of STS in different gender groups in Henan Province Cancer Hospital in 2006~2016