Testicular Tumours- A 10 Years' Experience in a Tertiary Care Hospital of Western Odisha

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ABSTRACT

BACKGROUND

Testicular tumours are one of the most common neoplasms occurring in males in the age group of 15 to 44 years. Incidence rate is about 1% of all malignant tumours in males. Germ Cell Tumour (GCT) accounts for 95% of all testicular tumours. Testicular dysgenesis syndrome, maternal in utero exposure to diethyl stilbestrol (DES) and family history of testicular tumours are important etiological factors for the development of testicular tumours. Clinical findings with various diagnostic tools like serum markers, radiological study along with histopathological study is used to determine the tumour type and subsequent treatment.

METHODS

A retrospective study of testicular tumours for a period of ten years from January 2009 to December 2019, was undertaken in a tertiary care centre to determine the clinico-pathological correlation of various types of testicular tumours.

RESULTS

A total of 35 cases were studied. Most common age group for tumour presentation was the 3rd decade of life contributing 42.85% of total cases. Present study found seminoma (42.85%) to be the most common testicular tumour, followed by mixed germ cell tumour (34.28%). Whereas 6 (17.14%) patients presented with multiple lung metastasis during the diagnosis.

CONCLUSIONS

Testicular tumours are rare and have been increasing in many countries during last decades. Incidence rate of testicular tumour in India is low. WHO 2016 update for testicular tumour redefines few precursor lesions and accordingly it affects the disease treatment and prognosis. Tumour markers play major role in the diagnosis, treatment, prognosis and follow up.

KEY WORDS

Testicular Tumours, Incidence, Germ Cell Tumour

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BACKGROUND

Testicular tumours are rare and most common cause of painless testicular enlargement. Incidence rate is about 1-1.5% of all malignant tumours in males.[1] Germ cell tumours (GCT) constitutes 95% of all testicular tumours. Testicular GCT composed of single histological component in 60% cases and mixed GCT in 40% cases.[2] Environmental and genetic factor play a major role in pathogenesis of testicular tumour. Testicular GCTs are associated with testicular dysgenesis syndrome (TDS), among which cryptorchidism is one of the important factor.[3] Maternal risk factors such as late age at pregnancy, maternal in utero exposure to high endogenous oestrogen levels, exposure to synthetic oestrogen diethylstilboestrol (DES) during pregnancy and maternal smoking habit plays an important role in the aetiology and pathogenesis of testicular tumour. Family history of testicular cancer has increased risk of testicular cancer in persons whose father or brother had disease.[4] Klinefelter's syndrome has been associated with testicular cancer.[5] Incidence rate is highest in men between 15 to 35 years of age.[6] Testicular tumours are mainly a disease of young adults and middle aged men with low incidence in children and teenagers.[7] Germ cell neoplasia in situ (GCNIS), a new terminology for precursor lesions has been added to the World Health Organisation(WHO) 2016 updates. GCNIS composed of enlarged hyper chromatic nuclei, clumped chromatin and prominent nucleoli arranged along the basement membrane of seminiferous tubules in the spermatogonial niche. Testicular GCTs are divided into two groups, such as tumours derived from GCNIS (postpubertal type) and GCTs not derived from GCNIS (predominantly occurring in prepubertal patients). Spermatocytic tumour is a replacement for spermatocytic seminoma to differentiate it from usual seminoma which is unrelated to it. Testicular tumours are grouped into Germ cell tumour derived from (GCNIS), Non Seminomatous germ cell tumour of more than one histological type, GCT unrelated to GCNIS, sex cord stromal tumours, lymphoma and metastatic group.[8] The various diagnostic methods such as physical examination, ultrasonography of scrotum and abdomen, blood tests (serum markers like human chorionic gonadotropin, alpha–fetoprotein and lactate dehydrogenase), surgical removal followed by histopathological tests are required for accurate diagnosis.[9] Several immunohistochemical (IHC) markers are useful and sensitive in diagnosing GCTs. These biomarkers are expressed by genes in primordial germ cells and embryonic pluripotent cells, but not in adult germ cells, they are PLAP, OCT3/4, NANOG, SOX2, REX1, AP-2Y and LIN28.[10] Testicular tumours have a good prognosis even with metastatic disease at diagnosis, with 5 years of survival rate up to 95% according to SEER data from 2009 to 2015. Survival rate depends on histopathological type, state of the disease, tumour markers and metastatic disease.[11]

METHODS

This is a retrospective study for a period of 10 years conducted in the Department of Pathology, VIMSAR, Burla, from January 2010 to December 2019. All the patients with histopathologically confirmed testicular cancer cases were included in the present study. Non neoplastic testicular specimens are excluded from the study group. The details of the patients were collected from histopathological records. All the preserved specimens were re-examined, paraffin blocks of testicular malignancies were recut, stained with haematoxylin and eosin (H & E), reviewed and reported according to WHO 2016 classification of Testicular tumours. The clinical presentation of patients, ultrasonography of abdomen and scrotum, CT scan, MRI report, chest X-ray and tumour marker status of these patients were studied. IHC and special stains were done where required.

Inclusion Criteria

Patients with histopathologically confirmed neoplasm were included in the study group.

Exclusion Criteria

Patients clinically diagnosed as testicular mass but histopathologically diagnosed as non-neoplastic diseases were excluded from the study group.

RESULTS

Since January 2010 to December 2019 a total of 4375 male patients were diagnosed with carcinomas of various organs, of which total 35 patients were diagnosed with testicular tumours, constituting 0.8% of total male malignancy. Most of the patients presented with testicular tumours in the 3rd decade of life which constitute 42.85% of cases (Table-1). The youngest patient was a 9 years old child with testicular teratoma (prepubertal type) and the oldest one was a 65 years male with testicular lymphoma. Most common clinical presentation was painless testicular swelling followed by inguinoscrotal swelling (Table-2). 4 patients (11.42%) had history of undescended testis. 2 patient (5.71%) had family history of testicular carcinoma. Para-aortic group of lymph node metastasis was found in 67% cases with one patient showing inguinal node metastasis with a history of incomplete orchidectomy 2 months earlier. In the present study seminoma (42.85%) was the most common testicular tumour, followed by mixed germ cell tumour (figure 1) (34.28%) (Table-3). In our study most of the patients were in clinical stage 3. CT scan and MRI reports of 6 (17.14%) patients showed multiple lung metastasis.

Age Group	No. of Patients	%
0-10	1	2.85%
11-20	2	5.70%
21-30	15	42.85%
31-40	13	37.15%
41-50	3	8.60%
51-60	0	0%
61-70	1	2.85%

Table 1. Distribution of Patients According to Age Group (N=35)

Clinical Presentation	No. of Cases	%
Painless testicular swelling	21	60%
Inguinoscrotal swelling	8	22.85%
Undescended testis	4	11.43%
Testicular heaviness	2	5.72%

Table 2. Clinical Presentation of Patients Having Testicular Tumour (N=35)

Histopathological Type	No. of Cases	%
A- GCT derived from GCNIS		
1-SEMINOMA(pure form)	15	42.85%
2-Non Seminomatous GCT		
a- Embryonal Carcinoma-	1	2.85%
b- Yolk sac tumour (YST)	1	2.85%
c- Teratoma (post pubertal type)	2	5.71%
d- Non Seminomatous GCT more than one histological type- Mixed GCT -	12	34.28%
B- GCT unrelated to GCNIS		
a-Spermatocytic tumour	1	2.85%
b- Teratoma pre-pubertal type	1	2.85%
C- Sex Cord Stromal Tumour	1	2.85%
D-Haematolymphoid Tumours		
Diffuse Large B Cell Lymphoma	1	2.85%

Table 3. Histopathological Types of Testicular Tumour (N=35)

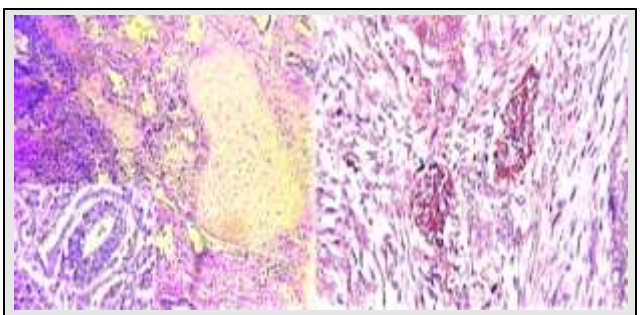

Figure 1. (A) Mixed Germ Cell Tumour (Teratoma + Embryonal + YST), Inset Shows Schiller Duval Body of YST (H & E 100X). (B) IHC AFP Positive

DISCUSSION

In the present study we found 35 patients with testicular tumour in a 10 years retrospective study, where the total 4375 male patients with malignancy of different organs were diagnosed. Testicular tumour incidence is 0.8% of all diagnosed male malignancies in our study. Our study co-relates with the study of Chalya et al,[12] Sharma S et al,[13] and with the global incidence rate.[8] Shanmugalingam T et al,[14] found in their study that incidence of testicular cancer in India was lowest (0.5 per 100,000 men). Majority (42.85% of cases) were in the third decade of life, which co-relates with the study of Deotra A et al[15] and Kurohana et al.[16] Most common clinical presentation in this study was painless testicular swelling (60%), whereas in the study of Chalya et al[12] they found 85.7% of cases presented as testicular swelling.

We observed 67% of cases showing left side testicular involvement but Deotra A et al[15] found 60% cases showing right testicular involvement. Family history of testicular cancer in our study was 5.71% of cases which correlates with the study of Nordsborg RB et al.[17] Undescended testis in our study was 11.42% which was compared to the study of Swerdloo AJ et al.[18] GCT is the commonest tumour in our study constituting 94% of cases. According to Victoria M. Chia et al[19] testicular GCT constitutes 98% of all testicular malignancies. In present study seminoma constitute 42.85% of cases, it is co-related with the study of Sharma S et al.[13] In the study of Ugwumba FO et al[20] they found 33.33% cases of GCT are seminomatous tumour and mixed GCT constitutes 12.5% of cases. In our study we found 34.28% of cases are mixed GCT. According to Armita Bahrami et al, mixed GCT is the second most common GCT after Seminoma and comprises of 30-50% of all testicular tumours.[21] By definition post pubertal teratoma is a malignant germ cell tumour composed of one or more germ layers, may be composed of exclusively well differentiated matured tissue. Teratoma (post pubertal type) found in pure form 2.7 to 7% of all GCT and as a component of mixed GCT 45-50% of cases.[8] In our study we found 5.71% cases of pure form of post pubertal teratoma and one (2.85%) case of NHL (Diffuse large B cell lymphoma) in a 65 yrs. male. Lantz AG et al found median age of testicular lymphoma was 65 years with incidence rate 2% in a study of 12 cases of malignant lymphoma of the testis.[22] Tumour markers like α-fetoprotein (AFP), β-human chorionic gonadotropin (β-HCG), and lactate dehydrogenase (LDH), play an important role in the diagnosis of distant metastatic diseases, follow up of cases and relapse cases.[23]

CONCLUSIONS

Testicular tumours are rare and have been increasing in many countries during the last decades. Incidence rate of testicular tumour in India is low. WHO 2016 update for testicular tumour redefines few precursor lesions and accordingly it affects the disease treatment and prognosis. Tumour markers have a major role in diagnosis, treatment and prognosis.

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