CHARACTERISTIC CHEMOTHERAPY RESPONSE OF TESTICULAR CANCER PATIENTS IN TERTIARY HOSPITAL

[1]Dio Mafazi Fabrianta, [1]Kurnia Penta Seputra, [1]Besut Daryanto.

[1] Department of Urology, Faculty of Medicine/University of Brawijaya, Saiful Anwar General Hospital, Malang.

ABSTRACT

Objective: *The purpose of this study was to determine the correlation of testicular tumor markers on the success of chemotherapy in my institution.* ***Material & Methods:*** *This research is a retrospective study single center using the medical record database at the span of the research period. The patient with testicular carcinoma who underwent complete chemotherapy between 2017 until 2022 was included. The data collected and analyzed by descriptive data and analytical correlation using SPSS Ver. 25. The comparation test using T-test and Anova.* ***Results:*** *A total of 31 testicular cancer patients were enrolled in the study. Fifteen patients were seminoma and 16 patients were non-seminoma. The mean age of patient at presentation of seminoma and non seminoma were 38.3 ± 17.03 and 30.74 ± 13.01. Most patients presented a karnofsky score about 79 ± 15. There was a negative correlation (r=-0.492) with a significant correlation between the types of testicular carcinoma cases and the response to chemotherapy (p=0.027). There was a significant difference in cases of seminoma and non-seminoma to the success of the chemotherapy response (p=0.024). There was a positive correlation between serum β-HCG, AFP, LDH with serial chemotherapy result with a no significant correlation (p=0.879; p=0.242; and p=0.277).* ***Conclusion:*** *Most types of the testicular carcinoma responses to chemotherapy. Patients with seminoma pathology have better response to chemotherapy compared to non-seminoma.*

Keywords: *Chemotherapy, testicular cancer, tumor marker.*

ABSTRAK

Tujuan: *Tujuan dari penelitian ini adalah untuk mengetahui hubungan tumor marker testis dengan keberhasilan kemoterapi di institusi saya.* ***Bahan & Cara:*** *Penelitian ini merupakan penelitian retrospektif single center dengan menggunakan database rekam medis pada rentang periode penelitian. Pasien dengan karsinoma testis yang menjalani kemoterapi lengkap antara 2017 hingga 2022 dimasukkan. Data dikumpulkan dan dianalisis dengan data deskriptif dan korelasi analitik menggunakan SPSS Ver. 25. Uji komparasi menggunakan T-test dan Anova.* ***Hasil:*** *Sebanyak 31 pasien kanker testis terdaftar dalam penelitian ini. Lima belas pasien adalah seminoma dan 16 pasien non-seminoma. Usia rata-rata pasien pada presentasi seminoma dan non seminoma adalah 38.3 ± 17.03 dan 30.74 ± 13.01. Sebagian besar pasien menunjukkan skor karnofsky sekitar 79 ± 15. Ada korelasi negatif (r=-0.492) dengan korelasi yang signifikan antara jenis kasus karsinoma testis dan respons terhadap kemoterapi (p=0.027). Terdapat perbedaan yang signifikan pada kasus seminoma dan nonseminoma terhadap keberhasilan respon kemoterapi (p=0.024). Terdapat hubungan positif antara -HCG serum, AFP, LDH dengan hasil kemoterapi serial dengan hubungan yang tidak bermakna (p=0.879; p=0.242; dan p=0.277).* ***Simpulan:*** *Sebagian besar jenis respons karsinoma testis terhadap kemoterapi. Pasien dengan patologi seminoma memiliki respon yang lebih baik terhadap kemoterapi dibandingkan dengan non-seminoma.*

Kata Kunci: *Kemoterapi, kanker testis, tumor marker.*

Correspondence: Besut Daryanto; c/o: Department of Urology, Faculty of Medicine/Brawijaya University, Saiful Anwar General Hospital, Jl. Jaksa Agung Suprapto No.2, Klojen, Kec. Klojen, Kota Malang, Jawa Timur 65112, Indonesia. Phone: +6282233678283, Fax: +62341333030, Email: urobes.fk@ub.ac.id.

INTRODUCTION

Testicular cancer consists of different neoplasms, depending on the cell of origin and the typical age at presentation, but germ cell-derived tumors constitute the majority of cases. Germ cell tumors can be diagnosed in any age group, but more than 90% of cases occur in young men. These tumors, consisting of seminomas and non seminomas, originate from germ cell neoplasia in situ (GCNIS).[1-2]

Testicular germ cell tumor (GCT) represents a malignancy with many unusual features: It is a rare disease with an incidence of only 8-10 per 100

thousand men per year in northern European countries. In contrast to most other malignancies, this neoplasm has a peak incidence in young men aged 20-45 years, and most notably, more than 90% of cases are curable. Clinically, the most relevant characteristics consisted of histology, clinical stage and pT, primary tumor size, age, and serum biomarkers of beta-human chorionic gonadotropin (bHCG), alpha-fetoprotein (AFP) and lactate dehydrogenase (LDH). Although each of these characteristics is fundamentally well recognized, the possible interrelationships between the various parameters are still not well understood.[3-5]

Indonesia has ethnic variations and different geographical distributions, but data on the clinical presentation of testicular tumors and their management are still underreported.

OBJECTIVE

The purpose of this study was to determine the correlation of testicular tumor markers on the success of chemotherapy in the Indonesian population, especially Malang.

MATERIAL & METHODS

This research is a descriptive and analytic study using a medical record database in the span of the research period. All patients, both Urology outpatient clinic and inpatients who experienced testicular carcinoma between 2017 until 2022. This study is conducted in my institution. This research was accepted by ethical clearance Saiful Anwar General Hospital (400/133/K.3/102.7/2022).

Inclusion criteria are patients diagnosed as testicular tumors and undergoing complete chemotherapy.

Collection data in this study is to collect data consecutively inpatients who will be treated both conservatively and operatively and met the inclusion criteria. The data that has been collected is edited and entered and then analyzed by descriptive data and analytical correlation. The data was analized by SPSS Ver. 25. We used comparation test with T-test and Anova.

RESULTS

The sample size in the study was 31 patients. The sample selection is consecutively retrospective, namely patients who meet the inclusion criteria and are fully recorded in inpatient and outpatient medical records, so that preoperative demographic data and postoperative follow-up can be known.

In this study, a correlation test was conducted between seminoma and non-seminoma cases (based on tumor marker) on the response to complete, partial, and progressive chemotherapy. There was a negative correlation (r=-0.492) with a significant correlation between the types of testicular carcinoma cases and the response to chemotherapy (p=0.027).

Table 1. Characteristic based on age.

Characteristic	N	(%)
Age (Year)		
<15	4	12.9%
15-35	15	48.3%
>35	12	38.8%

Table 2. Characteristic based on anatomical pathologic.

Characteristic	N	(%)
Seminoma	15	53.57%
Yolk Sac	6	17.86%
Embryonal	2	3.57%
Teratoma	7	21.43%
Adenocarcinoma	1	3.57%

Table 3. Comparative Test Results Non seminoma and Seminoma Testicular cancer.

	Non seminoma	Seminoma	P value
Age (mean±sd)	38.3 ± 17.03	30.74 ± 13.01	0.23
Past Medical History			0.85
Positive	4	4	
Negative	14	9	
Comorbid			0.97
Positive	0	0	
Negative	16	15	
BSA (mean±sd)	1.57 ± 0.11	1.5 ± 2.3	0.38
Karnofsky score (mean±sd)	80 ± 8.7	79 ± 15.7	0.86
Location			0.78
Left	10	6	
Right	6	9	
Serial chemotherapy Results			0.024
Complete	6	13	
Partial	1	2	
Stable disease	2	0	
Progressive disease	7	0	

Based on the test results in the table above, it can be seen that age, past medical history, comorbid, BSA, location, and karnofsky score have a non-significant p-value. Therefore, it can be concluded that there is no significant difference between these factors. There was a significant difference in cases of seminoma and non-seminoma to the success of the chemotherapy response (p=0.024) so it can be concluded that the case of testicular carcinoma was significant to the success of the chemotherapy response.

Then, we conduct correlation between Serum β-HCG, AFP, LDH with serial chemotherapy result. There is no significant correlation within all parameters (p=0.879; p=0.242; and p=0.277, respectively).

DISCUSSION

After completion of chemotherapy or radiotherapy, evaluation of tumor markers and imaging studies is mandatory, residual seminoma mass should not be resected, regardless of its size, but should be monitored regularly with imaging studies and tumor markers. The FDG-Pet has high positive and negative predictive value with respect to the question of remaining vital disease in patients with residual mass after seminoma treatment. in patients with positive FDG-Pet findings, biopsy or resection should be performed.[5-6]

Overall, after chemotherapy for residual tumors in patients with testicular germ cell tumors, only 10% of the residual mass contained viable cancer, 50% contained mature teratomas and 40% contained necrotic tissue. After initial chemotherapy, residual germ cell tumors and mature teratomas (chemotherapy-resistant tumors) will develop if left untreated. Therefore, completeness of residual tumor resection is an independent and consistent predictive variable of clinical outcome.[7]

There are studies comparing the correlation of testicular histological responses. In a study by Simmonds et al of 13 patients there was a histologic correlation between orchidectomy and extragonadal metastases in resected specimens. However, in a study by Leibovitch et al, less than half of patients had a histologic correlation.[8-9]

There are some limitations of this research. This includes short patient follow-up and thus long-term survival for the study population remains to be answered. There is incomplete preoperative clinical information as most of the patients present after orchiectomy elsewhere. In patients presenting after orchiectomy, tumor marker levels are unavailable or unreliable. This study involved an incomplete sample size considering the low incidence of testicular carcinoma. There is limited sample size which cannot determine the true correlation. To the author's knowledge, this study is the first study of its kind reported from Malang Indonesia.

CONCLUSION

Most types of the testicular carcinoma responses to chemotherapy. Patients with seminoma pathology have better response to chemotherapy compared to non-seminoma.

REFERENCES

1. Stewart WF, Van Rooyen JB, Cundiff GW, Abrams P, Herzog AR, Corey R, Hunt TL, Wein AJ. Prevalence and burden of over-active bladder in the United States. World J Urol. 2003; 20: 327–336.
2. Haylen BT, de Ridder D, Freeman RM, Swift SE, Berghmans B, Lee J, Monga A, Petri E, Rizk DE, Sand PK, Schaer GN. An International Urogynecological Association (IUGA)/International Continence Society (ICS) joint report on the terminology for female pelvic floor dysfunction. Neurourol Urodyn. 2010; 29: 4–20.
3. Van Dijk MM, Wijkstra H, Debruyne FM, De La Rosette JJ, Michel MC. The role of nocturia in the quality of life of men with lower urinary tract symptoms. BJU Int. 2010; 105: 1141–1146.
4. Middelkoop HA, Smilde-van den Doel DA, Neven AK, Kamphuisen HA, Springer CP. Subjective sleep characteristics of 1,485 males and females aged 50–93: effects of sex and age, and factors related to self-evaluated quality of sleep. J Gerontol A Biol Sci Med Sci. 1996; 51: M108–115.
5. Budaya TN, Daryanto B. Kemoterapi Kanker Urogenital. Universitas Brawijaya Press; 2020 Jul 31.
6. Hartmann, J. T., Bamberg, M. & Albers, P. Multidisciplinary treatment and prognosis of patients with central nervous metastases (CNs) from testicular germ cell tumour (GCT) origin [abstract 1607]. Proc. Am. Soc. Clin. Oncol. 2003; 22: 400.
7. Krege, s. et al. european consensus conference on diagnosis and treatment of germ cell cancer: a report of the second meeting of the european Germ Cell Cancer Consensus Group (eGCCCG): part II. Eur. Urol. 2008; 53: 497–513.
8. Eble, J. N., sauter, G., epstein, J. I. & sesterhenn, I. A. (eds) WHO Classification of Tumours. Pathology and Genetics. Tumours of the Urinary System and Male Genital Organs Ch. 2004; 4: 250–262.
9. P D Simmonds 1, G M Mead, A H Lee, J M Theaker, K Dewbury, C J Smart. Orchiectomy after chemotherapy in patients with metastatic testicular cancer. Is it indicated? Cancer. 1995; 75: 1018–24.
10. Leibovitch 1 , J S Little Jr, R S Foster, R G Rowland, R Bihrle, J P Donohue. (1996).Delayed orchiectomy after chemotherapy for metastatic nonseminomatous germ cell tumors. J Urol. 1995; 155: 952–4.