

ORIGINAL ARTICLE

Risk Factors of Testicular Cancer in Arifin Achmad Regional General Hospital, Pekanbaru, Riau Province, Indonesia

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ABSTRACT

Objective: To evaluate the incidence rate, patient profile, and risk factors of testicular cancer patients.

Materials & methods: We reviewed the medical records of incidence rate, patient profile, and risk factor of testicular cancer patients in Arifin Achmad Hospital Regional General of Riau Province in January 2013 to December 2018. The data collected were age, ethnic/tribes, city/district origin, histopathology types, smoking history, history of cryptorchidism, family history and a history of testicular cancer. Approval on the study was obtained from the Ethical Review.

Result: There were 22 testicular cancer patients, consisting of 91% seminoma and 9 % nonseminoma. Testicular cancer was frequently (45.5%) diagnosed in the 15-34 age group. Most patients came from Pekanbaru city in 41.1% and most (45.4%) patients were Malay tribes followed by Javanese and Batak tribes. Fifty nine percent of patients had risk factors for smoking history and history of cryptorchidism, family history, a history of testicular cancer were not found in this study.

Conclusion: Risks factors of testicular cancer patients in our hospital were Pekanbaru city origin, Malay tribe, smoking history, history of cryptorchidism, family history and a history of testicular cancer.

Keywords: testicular cancer, risk factor, Riau, Indonesia

INTRODUCTION

Testicular cancer is the most malignancy in men aged 15-34 years and constitutes 1-2% of all malignancies in men. Most (\pm 95%) of testicular cancer originates from testicular germ cell tumor, the rest comes from testicular non germ cell tumor.¹ The American Cancer Society (ACS) estimates that around 9310 new cases Testicular cancer will be diagnosed during 2018 in the United States. According to Surveillance, Epidemiology, and End Results (SEER) data, the number of new cases of testicular cancer is 5.7 per 100,000 men per year, and the number of deaths is 0.2 per 100,000 men per year.²

Testicular cancer constitutes 22.72% of malignancy in the field of urology that occurred in Arifin Achmad Hospital in Riau Province for 3 years (2006-2009), with the second highest after urinary vesicular cancer. The age of most patients is 15-34 years. The results of histopathological examination showed more non-seminoma types compared to seminoma.³

The risk factors for testicular cancer are not yet known, but some of them are a history of cryptorchidism (Undescended of testicle / UDT), family history, a history of testicular cancer and a history of smoking. Cryptorchidism is a genitourinary disorder

characterized by the testes not dropping normally into the scrotum at birth and unable to be moved manually to the proper position, resulting in chronic thermic trauma that triggers malignant degeneration.^{4,5} Men who have had testicular cancer previously able to experience new cancer.⁵ Approximately 1-2% of testicular cancer patients will develop second primary testicular cancer contralater.² Testicular cancer can also occur in men whose fathers and brothers suffer from testicular cancer and are thought to be caused by changes in certain genes incorrectly only the Klinefelter syndrome can interfere with the sex hormones in the sufferer.⁶ In smokers the chemical carcinogens can modify the sex hormones involved in the development of the testicles so that they can cause testicular cancer.⁷

MATERIALS AND METHODS

This was a descriptive study by reviewing medical records of incidence rate, patient profile, and risk factors of testicular cancer in Arifin Achmad Regional General Hospital of Riau Province in January 2013 up to December 2018. The data collected were age, ethnic/tribes, city/district origin, histopathology types, smoking history, history of cryptorchidism,

family history and a history of testicular cancer. Approval on the study was obtained from the Ethical Review Board for Medicine and Health Research, Medical Faculty, University of Riau.

RESULTS

There were 22 testicular cancer patients in this study and the highest incidence was in 2016 as many as 31.8% and there were only 4.5% in 2014 and 2018 (see in Table 1) where most testicular cancer patients occur in the 15-34 age group, 45.5% (See in Table 1). Most (41.1%) patients came from Pekanbaru city (See in Table 2), and most (45.4%) patients were Malay tribes followed by Javanese and Batak tribes (See in Table 2). The results of histopathology were in the form of seminomas (91%) and non-seminomas (9%) (See in Table 3). Fifty-nine percent of patients have risk factors for smoking history (See in Table 3). There are no testicular cancer patients who have a history of cryptorchidism (0%) (See in Table 3). There are no testicular cancer patients who have a family history (0%) (See in Table 3). No testicular cancer patient has a history of testicular cancer (0%) (See in Table 3).

DISCUSSION

There were 22 testicular cancers in this study and there were increases of the case amount annually except in 2014 and 2018 in 1 (4.5%) cases. The amount of testicular cancer in Arifin Achmad Regional General Hospital increased in Fellyana study (2015) in the period 2009 to 2014 in 15 cases and Yuwinanda study (2011) in the period 2006 to 2009 in 15 cases.^{3,8}

Research in the United States showed the incidence of testicular cancer had increased over the past 30 to 40 years.⁹ Progress in the treatment of testicular cancer was a major achievement in the treatment of cancer with a cure rate of 95%. Combining chemotherapy, surgery and radiotherapy resulted in a high cure rate even in metastatic cancer of the testicular germ cell.¹⁰ The major findings that had been found in the treatment of advanced testicular cancer had resulted in a cure rate of 25% in the middle of 1970s to almost 80% in 2014 This cure rate was the highest among other solid tumor treatments and an increase in survival was due to the effectiveness of chemotherapy in the treatment of testicular cancer.^{10,11} More than 80% of men with metastatic metastatic germ cell cancer can be cured. This was due to sensitivity to combination chemotherapy based on cisplatin.¹²

This study showed that cases of testicular cancer were more common in the 15-34 year age group (45.5%). The results of this study was in accordance with Yuwinanda's (2011) study found that the most

Table 1: Distributive frequency of testicular cancer patients according to year and age

Variables	Cases (n=22) (%)
Year	
2013	3 (13.6)
2014	1 (4.5)
2015	5 (22.8)
2016	7 (31.8)
2017	5 (22.8)
2018	1 (4.5)
Age (year)	
0-14	4 (18.2)
15-34	10 (45.5)
35-54	7 (31.8)
55-65	1 (4.5)
>65	0 (0)

Table 2: Distributive frequency of testicular cancer patients according to origin and tribe

Variables	Cases (%)
Origin(n=22)	
Pekanbaru City	9 (41.1)
Dumai City	0 (0)
Bengkalis District	1 (4.5)
Inhil District	0 (0)
Inhu District	1 (4.5)
Kampar District	5 (22.8)
Kuansing District	1 (4.5)
Pelalawan District	3 (13.6)
Rohil District	1 (4.5)
Rohul District	0 (0)
Siak District	1 (4.5)
Meranti Island District	0 (0)
Tribe (n=18)	
Malay	10 (45.4)
Minang	3 (13.6)
Batak	4 (18.2)
Javanese	5 (22.8)
Chinese	0 (0)

Table 3: Clinical variables in testicular cancer patients

Variables	Cases (n=22) (%)
Histopathology types	
Seminoma	20 (91)
Non seminoma	2 (9)
Smoking History	
No	9 (40.9)
Yes	13 (59.1)
History of cryptorchidism	
No	22 (100)
Yes	0 (0)
Family history	
No	22 (100)
Yes	0 (0)
History of testicular cancer	
No	22 (100)
Yes	0 (0)

common age occurred in groups of 15-34 years.³ This study was also in accordance with the research in Sardjito Hospital in the period 2007 to 2013 which stated the incidence of testicular cancer as well as the average age of about 28 years with a number of patients under 30 years more dominates.¹³ Increased technological advances testicular cancer patients can be diagnosed early so that they might have a good prognosis.¹¹ This study found the lowest age of 2 years while the highest age was 62 years.

The patients from Pekanbaru city had the highest percentage (41.1%) and Kampar District had the second highest percentage (22.8%) in this study. This was related to access to health services because Arifin Achmad Hospital in Riau Province is in the city of Pekanbaru, making it easier to reach for patients from Pekanbaru and Kampar. Pekanbaru City is also the city with the most population and Kampar district also has the most population after Pekanbaru City compared to other regencies or cities in Riau Province.¹⁴

Malay tribe was the most in 9 (45.4%) patients followed by Javanese tribe in 5 (22.8%) and Batak tribe in 4 (18.2%) patients. The majority of tribal sequences in testicular cancer cases were in accordance with the distribution of the three largest tribes in Riau Province namely Malay, Javanese and Batak tribes.¹⁵ Arifin Achmad Regional General Hospital of Riau Province was the top referral hospital with more complete facility than districts or city in Riau Province. This might also be the reason that more Malay tribes were in this study.

Of all primary testicular cancers, 90-95% were germ cell tumors (seminoma and non-seminoma), the incidence of seminoma (60%) was higher than non-seminoma (40%).¹⁶ This study showed histopathology findings were mostly (91%) and non-seminomas in 9% of cases. The results of this study were in accordance with the Fellyana study (2015) in the 2009 to 2014 period which showed histopathology findings were seminoma 66.7% cases and non-seminoma in 33.3% cases. However, it was different from Yuwinda study (2011) from January 2006 to December 2009 showed histopathology findings was seminoma in 46.7% in cases and non-seminoma in 53.3% of cases.

Testicular cancer patients with a history of smoking were 59.1%. Data from Riskesdas (2013) found the highest active smokers who smoke every day were of 30-34 year age (33.4%). According to the central statistics agency, there were 29.61% of the population aged ≥ 15 years in Riau Province were smokers and the average Indonesian population who smoked spent 12 cigarettes per day.¹⁷

This study only obtained data on patients who were active smokers while patients who were smokers pas-

sive number unknown. Some of the harmful compounds contained in cigarettes are carcinogenic compounds (formaldehyde/formalin, benzene, polonium 210 and vinyl chloride), toxic metals (chromium, arsenic, lead, and cadmium) and toxic gases (carbon monoxide, hydrogen cyanide, ammonia, butane, and toluene). These compounds cause damage to body cells and modify sex hormones involved in the development of the testicles. Free radicals in cigarettes can increase cancer risk through DNA destruction.^{7,18}

This study showed patients with testicular cancer did not find history of cryptorchidism. Research by Thorup et al (2010) showed that 5% of men suffering from testicular cancer occur in men with a history of cryptorchidism.¹⁹ The study of Pettersson et al. showed that nearly 17,000 men who were treated for cryptorchidism between 1964 and 1999 with the average age of surgery were 8.6 years and found 56 people who developed testicular cancer. Based on these data the age recommended for orchidopexy before the age of 2 years.²⁰ There was a difference in this study likely due to early detection and immediate management with a procedure called orchidopexy to move the testes to the scrotum. Orchidopexy might reduce the risk of testicular cancer if being done when a child is younger. Experts in the United States recommend orchidopexy after the age of 1 year.²¹

This study was not obtained with testicular cancer with a family history. Swedish Family-Cancer had examined risk factors related to family history in fathers and brothers in 1961 to 2000. A total of 4,082 patients, 68 (1.67%) of whom had fathers or brothers affected testicular cancer.²² The increased risk of testicular cancer might be caused by an excess of the x chromosome that has an xxy chromosome or what is known as Klinefelter syndrome. Klinefelter syndrome is a genetic disorder in men where 1 in 550 to 1 in 1000 male babies born will suffer from this syndrome. Patients with Klinefelter syndrome will fail in testicular development due to hypogonadism and disorders of spermatogenesis.²¹

This study was not obtained by patients with testicular cancer who had a history of having testicular cancer before. Cancer Treatment Centers of America states that only about 1 to 2 percent of men who have had cancer in one testis will later develop other testicular cancers.⁵ At present the authors have not found a publication on the history of having experienced testicular cancer before developing second primary testicular cancer contralateral.

CONCLUSIONS

Risks factors of testicular cancer patients in our hospital were Pekanbaru city origin, Malay tribe, histopathology types and smoking history.

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