

# 5-YEAR RELATIVE SURVIVAL RATE BETWEEN SEMINOMA AND NON-SEMINOMA TESTICULAR CANCER IN SINGLE CENTER

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## ABSTRACT

**Objective:** This study was conducted to provide data about the survival rate of testicular cancer patients with different histology in the year 2013 – 2017 in Adam Malik General Hospital and to compare these estimates with other studies conducted in another center. **Material & Methods:** Medical records of testicular cancer patients from 2013 to 2017 in Adam Malik General Hospital were collected. We measured 5-year relative survival between the histology group of seminoma and non-seminoma estimated using Kaplan-Meier survival analysis. Also, using Kaplan-Meier for survival analysis estimated, 5-year relative survival between metastatic and non-metastatic was estimated. **Results:** 63 male patients (mean age  $27.5 \pm 17.6$  years old) were included in this study. The distribution of histology were non-seminoma (53.9%), seminoma (39.9%), non-Hodgkin lymphoma (4.7%), and gonadoblastoma (1.5%). The 5-year relative survival rate was 82.5% for the seminoma group and 80.9% for the non-seminoma group. The 5-year survival rate in the seminoma group with metastatic was 77.8% and in the non-metastatic group was 87.3%. The 5-year survival rate in the non-seminoma group with metastatic was 74.6% and in the non-metastatic group was 88.9%. **Conclusion:** 5-year relative survival was better for the seminoma group than the non-seminoma group. Moreover, non-metastasis seminoma was found to have a better outcome than the metastatic group. Despite that, in the non-metastatic group, it is found that non-seminoma testicular cancer has a better survival rate than seminoma testicular cancer.

**Keywords:** 5-year relative survival rate, seminoma, non-seminoma, testicular cancer.

## ABSTRAK

**Tujuan:** Studi ini bertujuan untuk menyediakan data mengenai angka kesintasan relatif pasien kanker testis dengan berbagai histologi dari tahun 2013-2017 pada Rumah Sakit Umum Adam Malik dan membandingkannya dengan data penelitian lain. **Bahan & Cara:** Pengumpulan data dilakukan dari rekam medis pasien kanker testis dari tahun 2013-2017 pada Rumah Sakit Umum Adam Malik. Angka kesintasan 5-tahun antara grup seminoma dan non-seminoma serta grup metastasis dan non-metastasis diestimasikan menggunakan analisis kesintasan Kaplan-Meier. **Hasil:** 63 pasien kanker testis (rerata umur  $27.5 \pm 17.6$  tahun) merupakan subjek dari penelitian ini. Distribusi histopatologi dari kasus yang ditemukan antara lain non-seminoma (53.9%), seminoma (39.9%), non-Hodgkin lymphoma (4.7%), and gonadoblastoma (1.5%). Angka kesintasan relatif 5-tahun pada grup seminoma yang mengalami metastasis adalah 77.8% dan pada seminoma non-metastasis adalah 87.3%. Sedangkan angka kesintasan 5-tahun pada grup non-seminoma yang mengalami metastasis adalah 74.6% dan pada non-seminoma non-metastasis adalah 88.9%. **Simpulan:** Angka kesintasan relatif 5-tahun pada grup seminoma lebih baik daripada grup non-seminoma. Grup seminoma non-metastasis memiliki angka kesintasan relatif 5-tahun yang lebih baik daripada grup non-seminoma yang sudah mengalami metastasis. Akan tetapi, pada grup non-metastasis, grup non-seminoma memiliki angka kesintasan yang lebih baik dibandingkan grup seminoma.

**Kata kunci:** Angka kesintasan relatif 5-tahun, seminoma, non-seminoma, kanker testis.

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## INTRODUCTION

Testicular cancer is rare cancer with a prevalence was 1% to 2% of all neoplasms in men and boys.<sup>1-2</sup> In 2008, the survey by GLOBOCAN

estimated 55.000 new cases occurred in 2012 (0.7% of cancers found in men).<sup>3</sup> In 2016, the estimated incidence of testicular cancer was 8700 in the United States.<sup>2</sup> In the United States and Europe, there was 5.7 per 100.000 cases in 1992.<sup>4</sup> This number

increased to 6.8 per 100.000 in 2009.<sup>4</sup> With the development of treatment approaches, there was an increment of survival rates of testicular cancer from 2005 to 2011 (97%) compared to 1975 to 1977(83%).<sup>5</sup>

The GLOBOCAN data showed that in 2012, 55.300 new cases of testicular cancer and 10.400 deaths related to testicular cancer were found worldwide.<sup>6</sup> In Southeastern Asia, there were 2571 new cases of testicular cancer and 1236 deaths related to testicular cancer in 2012.<sup>6</sup> There were factors associated with survival including age at diagnosis, histologic classification, and treatment modalities.<sup>7</sup> Study by Fossa SD et al stated that mortality of patients with testicular cancer increase in the population age 40+ (HR, 2.00,  $P < 0.001$  for seminoma and HR, 2.09,  $P < 0.001$  for nonseminoma).<sup>8</sup>

In addition, the risk of death increase sevenfold in the population lack of retroperitoneal lymph node dissection.<sup>8</sup> Stang A stated that in the United States and Europe, 5-year relative survival rate of patients with histology group for spermatocyte seminoma reach almost 100% while the population with histology group for choriocarcinoma had the lowest 5-year relative survival rate.<sup>9</sup>

## OBJECTIVE

This study was conducted to provide data about the survival rate of testicular cancer patients with different histology in the year 2013 – 2017 in Adam Malik General Hospital and to compare these estimates with other studies conducted in another center.

## MATERIAL & METHODS

This was a retrospective cohort study. Sixty-three (63) male patients with histologically confirmed germ cell and non-germ cell testicular cancer were included in the study. These data were extracted from outpatient and inpatient medical record in Adam Malik General Hospital from January 2014 – March 2019. The patients age ranged from 1 year old to 72 years old. The histology group included seminoma, non-seminoma, non-hodgkin lymphoma, and gonadoblastoma. Data consisted of age, age at testicular cancer diagnosis, and age at death. Two-year relative survival between histology group of germ cell testicular cancer was estimated by using the Kaplan-Meier estimate for survival analysis.

## RESULTS

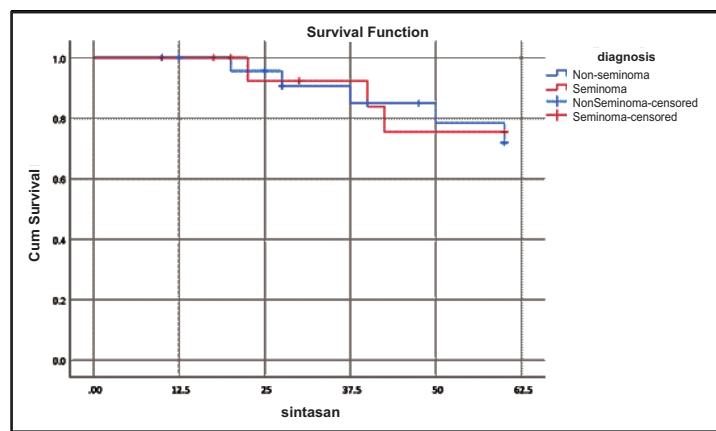
During the period of January 2014 through March 2019 in Adam Malik General Hospital, 63 cases of testicular cancer were recorded. The subjects included had mean age of  $27.5 \pm 17.6$  years old. The mean age of diagnosis of all types of testicular cancer was  $27.5 \pm 17.6$  years old. The mean age was  $34.94 \pm 17.37$  years old for seminoma group and  $21.09 \pm 15.27$  years old for non-seminoma group. The majority of these cancer were non-seminoma (53.5%). There were seminoma (39.5%), non-Hodgkin lymphoma (4.7%), and gonadoblastoma (2.3%). From the non-seminoma group, there were yolk sac tumor (87%), teratoma (8.6%), and papillary carcinoma (4.3%).

**Table 1.** Demographic Characteristics of The Patients.

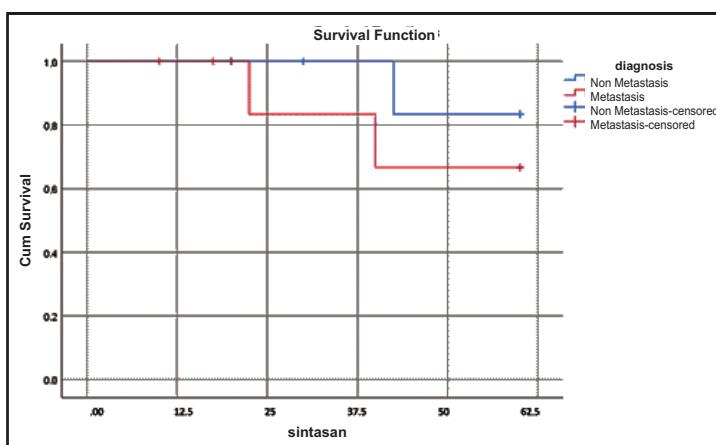
Age (Mean)	$27.5 \pm 17.6$ y.o
Seminoma	25 (39.5%)
Metastasis	13 (52%)
Non metastasis	12 (48%)
Non-Seminoma	34 (53.9%)
Yolk Sac	30 (88.2%)
Teratoma	3 (8.8%)
Papillary Carcinoma	1 (2.9 %)
Non-Hodgkin Lymphoma	3 (4.7%)
Gonadoblastoma	1 (1.5 %)

The 5-year survival rate among patients with seminoma and non-seminoma was presented in Figure 1. The 5 – year survival rate of patients with seminoma was almost 82.4 % and for patients with non seminoma was 80.8 %. There was no significant difference in the overall survival distribution between seminoma group and non seminoma group ( $P > 0.05$ ). The mean survival time for non seminoma group was 54.7 months while the mean survival time for seminoma group was 53.975 months. The 5-year survival rate among seminoma patients with metastatic and non metastatic were presented in Figure 2. The 5 – year survival rate of seminoma patients with metastatic was almost 77.8 % and seminoma patients with non metastatic was 87.5 %.

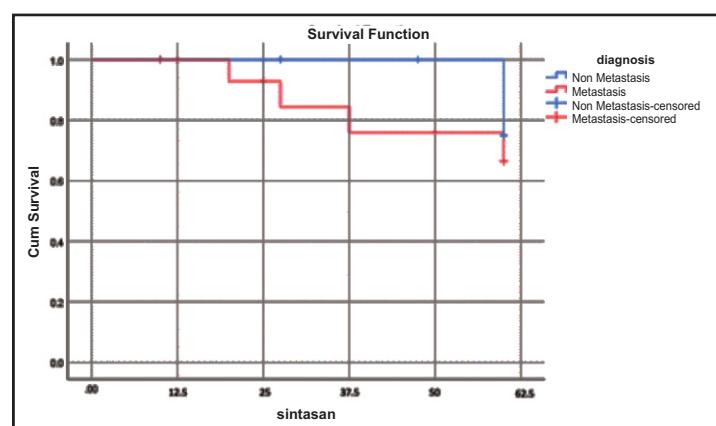
The 5-year survival rate among non seminoma patients with metastatic and non metastatic were presented in Figure 3. The 5 – year survival rate of non seminoma patients with metastatic was almost 88.9 % and non seminoma patients with non metastatic was 75 %.



**Figure 1.** Kaplan-Meier 5-year Relative Survival Analysis: A Comparison Between Seminoma and Non Seminoma Testicular Cancer.



**Figure 2.** Kaplan-Meier 5-year Relative Survival Analysis: A Comparison Between Seminoma Metastasis and Seminoma Non Metastasis Testicular Cancer.



**Figure 3.** Kaplan-Meier 5-year Relative Survival Analysis: A Comparison Between Non-Seminoma Metastasis and Non-Seminoma Non-Metastasis Testicular Cancer.

## DISCUSSION

In this study, the mean age of diagnosis in seminoma group was  $34.94 \pm 17.37$  years old and in non seminoma group was  $21.09 \pm 15.27$  years old. This result was in line with previous cohorts which stated that median age at diagnosis for seminoma group was older (36 to 40 years old) than non seminoma group (27 to 30 years).<sup>10</sup> The majority of these cancer were non seminoma (53.5%). There were seminoma (39.5%), non hodgkin lymphoma (4.7%), and gonadoblastoma (2.3%). From the non seminoma group, there were yolk sac tumor (87%), teratoma (8.6%), and papillary carcinoma (4.3%).

Germ cell tumors were classified into prepubertal and postpubertal type germ cell tumors of the testis.<sup>11</sup> Teratoma occurring in adult patients often contains malignant germ cell tumor components.<sup>11</sup> This malignant component is derived from the differentiation of seminoma or germ cell neoplasia in situ (GCNIS) to other tumor types such as embryonal carcinoma, choriocarcinoma, and yolk sac tumor.<sup>11</sup> On the other side, prepubertal testicular teratoma have characteristic of more organoid architecture, no significant cytologic atypia, no correlation with GCNIS, and no amplification of 12p.<sup>11</sup>

This study provides new data about the prognosis of testicular cancer in Indonesia. No significant difference of overall survival distribution was found between seminoma (82.4 %) and non seminoma group (80.8 %). However, the 5-year survival rate was higher in seminoma group than non seminoma group. This finding supports previous study by Stang A et al. that stated that the 5-year survival rate was better in seminoma group (97.1 %) than in non seminoma group (93.3 %).<sup>9</sup> In this study the survival rate for seminoma and non seminoma was lower than Stang A et al. study. It can be caused by the low awareness of patients to come to health services for treatment, so patients come with high stage.

This study stated that the percentage of the 5 year survival rate in metastatic seminoma was 77.8% and non metastatic seminoma was 87.5%. We can see in this study that metastatic seminoma was higher than non metastatic seminoma. This study had the same result too with the research that was conducted by Spermon JR et al. showing that 1-year survival rate in metastatic seminoma was 87.5% and in non metastatic seminoma was 99.5%. If we compare with the result that was conducted by Spermon JR et al, 3-year survival rate in metastatic

seminoma group was 83.3% and in non metastatic seminoma was 98.7%. Based on this study and Spermon JR et al we can conclude that the survival rate in metastatic seminoma group was higher than in non metastatic seminoma group.<sup>12</sup>

The percentage of the 2 year survival rate in metastatic non seminoma was 75.0% and non metastatic non seminoma was 88.9%. We can see in this study that metastatic non seminoma was higher than non metastatic non seminoma. This study had the same result too with the research that was conducted by Spermon JR et al. showed that 1-year survival rate in metastatic non seminoma was 80.9% and in non metastatic non seminoma was 95.2%. If we compare with the result that was conducted by Spermon JR et al, 3-year survival rate in metastatic non seminoma group was 65.0% and in non metastatic non seminoma was 90.9%. Based on this study and Spermon JR et al we can conclude that survival rate in metastatic non seminoma group was higher than in non metastatic non seminoma group.<sup>12</sup>

The study that was conducted by Ida et al. about metastatic seminoma showed 5-year survival rate of metastatic seminoma in stage I was 100%, stage II and III were 60%. If we compared with this study, this value of 5-year survival rate for stage I metastatic seminoma group was higher than metastatic seminoma group in this study. But if we compare with stage II and III the result was inferior than in this study.

According to WHO, spermatocytic seminoma was considered as spermatocytic tumour.<sup>11</sup> This tumor usually has nonaggressive behaviour.<sup>11</sup> Metastases was rarely found.<sup>11</sup> This tumor is typically cured by orchiectomy and there is usually no requirement for additional therapy apart from surveillance.<sup>11</sup> However, spermatocyte tumour with progression into sarcoma have more aggressive behaviour with high metastatic rate.<sup>11</sup>

## CONCLUSION

This study show that there is no significant difference of overall survival distribution between seminoma and non seminoma group of testicular cancer. However, 5-year survival rate was better in seminoma group than in non seminoma group. The 5-year survival rate was higher in seminoma non metastatic group than in metastatic group. The 5-year survival rate was higher in non seminoma non metastatic group than in metastatic group. Further study with more various histology groups may be

required to determine the association between histology group and survival rate.

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