PROGNOSTIC FACTORS FOR ORCHIDECTOMY IN TESTICULAR TORSION PATIENTS AT TERTIARY HOSPITAL

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ABSTRACT

Objective: *This study was conducted to analyze the prognostic factors for orchidectomy in testicular torsion patients.* ***Material &Methods:****From January 2001 to December 2021, 100 cases of testicular torsion cases were retrospectively collected. Data were described and analyzed based on clinical factors (age, duration of symptoms, scrotal swelling, high-riding testis, Prehn test, cremasteric reflex, leukocytosis, degree of twisting) and non-clinical factors (distance from hospital, duration of travel to hospital, education level and employment status) for each surgical procedure. Then logistic regression analysis was performed.* ***Results:*** *There were 88 testicular torsion patients (88%) underwent orchidectomy and 12 patients (12%) underwent orchidopexy. There was no significant relationship between age, duration of symptoms, scrotal swelling, Prehn test, cremasteric reflex, leukocytosis, distance from hospital, duration of travel to hospital, education level and employment status with orchidectomy (p>0.05). Significant prognostic factors for orchidectomy in testicular torsion patients were high-riding testis (OR = 0.06; 95% CI = 0.01-0.37; p = 0.002) and degree of twisting (OR = 0.04; 95% CI = 0.006-0.24; p = 0.000).* ***Conclusion:*** *High-riding testis and degree of twisting are prognostic factors for orchidectomy in testicular torsion patients.*

Keywords: *Orchidectomy, prognostic factors, testicular torsion.*

ABSTRAK

Tujuan: *Penelitian ini dilakukan untuk menganalisis faktor prognostik orkidektomi pada pasientorsio testis.****Bahan & Cara:*** *Dari Januari 2001 hingga Desember 2021, 100 kasus torsio testis dikumpulkan secara retrospektif. Data dideskripsikan dan dianalisis berdasarkan faktor klinis (usia, durasi gejala, pembengkakan skrotum, testis yang naik tinggi, tes Prehn, refleks kremaster, leukositosis, derajat puntiran) dan faktor non-klinis (jarak dari rumah sakit, lama perjalanan kerumah sakit, tingkat pendidikan dan status pekerjaan) untuk setiap prosedur pembedahan. Kemudian dilakukan analisis regresi logistik.* ***Hasil:*** *Terdapat 88 pasien torsio testis (88%) yang menjalani orkidektomi dan 12 pasien (12%) menjalani orkidopeksi. Tidak ada hubungan yang signifikan antara usia, durasi gejala, pembengkakan skrotum, tes Fren, refleks kremaster, leukositosis, jarak dari rumah sakit, durasi perjalanan ke rumah sakit, tingkat pendidikan dan status pekerjaan dengan orkidektomi (p>0,05). Faktor prognostik yang signifikan untuk orkidektomi pada pasien torsio testis adalah testis yang tinggi (OR = 0.06; 95% CI = 0.01-0.37; p = 0.002) dan derajat puntiran (OR = 0.04; 95% CI = 0.006-0.24; p = 0.000).* ***Simpulan:*** *Testis yang naik tinggi dan derajat puntiran merupakan faktor prognostik untuk orkidektomi pada pasien torsio testis*

Kata kunci: *Orkidektomi, faktor prognostik,torsio testis.*

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INTRODUCTION

Testicular torsion or torsion of the spermatic cord is a urological emergency that usually occurs in young men. It is the most common cause of testicular loss in adolescents and neonates. The annual incidence of testicular torsion is 3 - 4.5 in 100,000 men aged 1 to 25 years.[1] It can occur in men of any age but usually occurs in younger men, with a bimodal incidence in the pediatric population, particularly during the first year of life and between the ages of 13 and 16 years.[2] Delay in surgical management increases the risk of decreased testicular viability and leads to a poor prognosis. The

duration of symptoms, intratesticular blood flow, spermatic cord torsion degree, and monocyte counts all predicted effective testicular rescue following testicular torsion. Long-term testicular torsion symptoms, lack of blood flow, significant spermatic cord torsion, increased monocyte count, and decreased testicular rescue success rate. The previous study developed a nomogram based on these independent risk factors.[3]

OBJECTIVE

This study was conducted to analyze the prognostic factors, both clinical and non-clinical for orchidectomy in testicular torsion patients.

MATERIAL & METHODS

From January 2001 to December 2021, 100 cases of testicular torsion that were performed scrotal exploration at my institution were collected retrospectively. Data consisting of clinical factors (age, duration of symptoms, scrotal swelling, high-riding testis, Prehn test, cremasteric reflex, leukocytosis, degree of torsion) and non-clinical factors (distance from hospital, duration of travel to hospital, education level and employment status). Complete medical record on patients with testicular torsion undergoing orchidectomy was the inclusion criteria, while the exclusion criteria were incomplete medical record data, and patients who did not perform orchidectomy.

Data were described and analyzed using the Statistical Package for Social Science (SPSS) version 22.Data were presented as sums and percentages for categorical variables and Chi-Square analysis was applied to categorical data. Then multivariate analysis was performed using logistic regression test. The level of significant difference was defined as $p<0.05$ with a 95% confidence interval.

RESULTS

Data collected from medical record showed the mean age of the patients is 19.87 years. Most of the testicular torsion cases were carried out by scrotal exploration occurs in the age group ≤ 18 years. Of the 100 patients, 12 patients (12%) underwent orchidopexy because testis was still viable, whereas 88 patients (88%) underwent orchidectomy because testis could not be saved. (Table 1).

In univariate analysis, duration of symptoms (p=0.02), scrotal swelling (p=0.06), high-riding testis (p=0.000), and degree of torsion (p=0.000) were significantly associated with orchidectomy. Meanwhile, there were no significant relationship for other factors such as age (p=0.8), cremasteric reflex (p=0.4), Prehn test (p=0.4), leukocytosis (p=0.8), distance from hospital (p=1.0), duration of travel to hospital (p=0.252), education level (p=0.6) and employment status (p=0.17) (Table 1).

Then multivariate logistic regression analysis was performed and we found high-riding testis and degree of torsion were correlated with orchidectomy. High-riding testis was significantly associated and increased the likelihood of orchidectomy (OR = 0.06; 95% CI = 0.01-0.37; p = 0.002). The degree of torsion was also significantly associated and increased the likelihood of orchidectomy (OR = 0.04; 95% CI = 0.006 – 0.24; p = 0.000) (Table 2).

DISCUSSION

In this study, most cases of testicular torsion occurred in the age ≤ 18 years old with total of 63 patients (63%). There was no significant relationship between age and orchidectomy. The incidence of testicular torsion was estimated to be 1 in 4000 in men younger than 25 years old.1 Based on references, approximately sixty-five percent of cases of testicular torsion was occurred between ages of 12 and 18 years old.[2,4]

The average distance from hospital was 29.7 km and the duration of travel to the hospital is 44.9 minutes. Education level varied with college as many as 37 patients (37%) and 88% of patients were not working. In this study, there were no significant relationship between distance from hospital, duration of travel to hospital, education level, and employment status with orchidectomy. In another study, Bayne et al. showed that distance from hospital was statistically significant in multivariate analysis and became the strongest predictors of orchiectomy.[5] The difference of result could be caused by difference in research samples. Bayne et al. study used only boys as sample of the study, while this study covered all ages from children to adults with the range from 5 to 48 years old.

Duration of symptoms was calculated from the onset of symptoms until surgery. We found that 18 patients (18%) presented to the hospital emergency department in less than 6 hours (Table 1). However, duration of symptoms was not

Table 1. Univariate analysis of prognostic factors for orchidectomy in testicular torsion patients.

Characteristic	Surgical Procedure		p-value	OR (95% CI)
	Orchidopexy (N, %)	Orchidectomy (N, %)		
Age (years)				
• ≤ 18	8 (66.7)	57 (64.8)	0.8	1.0
• > 18	4 (33.8)	31 (35.2)		0.3 - 3.9
Duration of symptoms				
• ≤ 6 hour	5 (41.7)	13 (14.8)	0.02	4.1
• > 6 hour	7 (58.3)	75 (85.2)		1.1 - 14.9
Scrotal swelling				
• No	5 (41.7)	16 (18.2)	0.06	3.2
• Yes	7 (58.3)	72 (81.8%)		0.9 - 11.4
High-riding testis				
• No	8 (66.7)	13 (14.8)	0.000	11.5
• Yes	4 (33.3)	75 (85.2)		3.0 - 43.9
Cremasteric reflex				
• Positive	2 (16.7)	≤ 8 (9.1)	0.4	2.0
• Negative	10 (83.3)	80 (90.9)		0.3 - 10.7
Prehn test				
• Reduced pain	1 (8.3)	14 (15.9)	0.4	0.4
• Persisting pain	11 (91.7)	74 (84.1)		0.05 - 4.02
Leucocytosis				
• No	9 (75.0)	64 (72.7)	0.8	1.125
• Yes	3 (25.0)	24 (27.3)		0.2 - 4.5
Degree of torsion				
• 0-180 degree	8 (66.7)	10 (11.4)	0.000	15.6
• >180 degree	4 (33.3)	78 (88.6)		3.9 - 61.3
Distance from hospital				
• ≤ 30 km	9 (75.0)	66 (75.0)	1.0	1.0
• > 30 km	3 (25.0)	22 (25.0)		0.24 - 4.02
Duration of travel to hospital				
• ≤ 45 minutes	10 (83.3)	59 (67.0)	0.252	2.45
• > 45 minutes	2 (16.7)	29 (33.0)		0.5 – 11.9
Education level				
• Elementary-middle-high school	7 (58.3)	57 (64.8)	0.6	0.76
• University	5 (41.7)	31 (35.2)		0.22 - 2.6
Employment status				
• Unemployed	12 (100)	76 (86.4)	0.17	0.86
• Employed	0 (0)	12 (13.6)		0.79 - 0.93

significantly associated with orchidectomy (Table 2). This result was not in accordance with the research of Zvizdicet al. who noted that a short duration of symptoms was associated with salvage of the testis in children and adolescents with testicular torsion.[6] Bayne et al. also showed that the risk of orchidectomy was threefold higher in delayed cases compared with early cases.[7] The difference of result could be due to difference in grouping the duration of complaints. In this study, duration of complaints was grouped into ≤ 6 hours and > 6 hours, whereas Bayne et al. used < 24 hours and ≥ 24 hours.

Table 2. Multivariate analysis of prognostic factors for orchidectomy in testicular torsion patients.

Characteristic	p-value	OR (95% CI)
Duration of symptoms	0.23	0.3 (0.04 - 2.1)
Scrotal swelling	0.09	0.2 (0.04 - 1.3)
High riding testis	0.002	0.06 (0.01 – 0.37)
Degree of torsion	0.000	0.04 (0.006 - 0.24)
Employment status	0.99	0.0 (0.0 - .)

*, significance value (p<0.05); OR, odds ratio; CI, confidence interval.

High riding testis was significantly associated and increased the likelihood of orchidectomy (Table 2). Patients also had persistent pain that was not relieved by elevating the scrotum. Scrotal swelling was also one of the most common complaints of testicular torsion.[8] In this study, scrotal swelling was found in 79 patients (79%), but scrotal swelling was not associated with orchidectomy. For late cases, it was also found that the cremasteric reflex was absent. The presence of cremasteric reflex did not confirm the absence of testicular torsion.[9] In this study, cremasteric reflex and Prehn test were also not associated with orchidectomy.

Complete blood count test and urinalysis may be performed to rule out infection. Previous reports showed that leukocyte count was significantly greater in testicular torsion patients.[10] However, most studies did not differentiate between testicular torsion and epididymo-orchitis.[11-12] In this study, leukocytosis was not associated with orchidectomy.

Scrotal exploration should be carried out immediately if a testicular torsion was suspected. Scrotal exploration was performed with a para raphe incision. The incision was continued into tunica vaginalis, which may appear dark due to blood serum. It was necessary to evacuate accumulated hydrocele fluid and evaluate the affected testicle. Observe the color after detorsion procedure. Wrap with saline-moistened gauze and observe it for 10 to 15 minutes. If the testis become red, proceed with orchidopexy. If the testicle remains dark, proceed with orchidectomy and then contralateral orchidopexy.[13] In this study, orchidectomy was performed in 88 patients (88%) because the testis could not be saved, whereas orchidopexy was performed in 12 patients (12%). Orchidectomy rates vary widely in the literature, typically ranging from 39% to 71% in most of the literature. [14-15]

It was found that only high-riding testis and degree of torsion were correlated with orchidectomy. High-riding testis and degree of torsion were significantly associated and increased likelihood of orchidectomy (Table 2). Howe et al. reported that twisting of the spermatic cord more than 360 degrees increased the risk of unsalvageable testicle. The degree of testicular rotation multiplies the role of presentation delay in testicular torsion. A greater degree of testicular rotation indicated a higher risk of ischemia and necrosis due to reduced blood supply.[16] The limitations of this study were its retrospective nature and the limited number of patients. Further multicenter studies with larger sample sizes are needed to confirm these findings.

CONCLUSION

High-riding testis and degree of torsion were prognostic factors for orchidectomy in testicular torsion patients.

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