

Pregnancy Rates after Testicular Torsion



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Abbreviations and Acronyms

ER = emergency room
IVF = in vitro fertilization
Oec = orchiectomy
Opx = orchiopexy
PR = pregnancy rate
TT = testicular torsion

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Purpose: To our knowledge the effect of testicular torsion on the pregnancy rate is unknown. In this study we focused on the pregnancy rate, which is the ultimate index of fertility status.

Materials and Methods: We reviewed the records of 273 patients who presented to our emergency room with testicular torsion between 1994 and 2014. Study inclusion criteria included being in a relationship with the intent to conceive for at least 1 year, age greater than 25 years and a normal contralateral testis. Patients with primary infertility, those who were unwilling to participate or unreachable and those with a history of undescended testis and/or varicocele were excluded from analysis. Patients were contacted by telephone and interviewed according to a standardized questionnaire. Pregnancy rates in the orchiopexy and orchiectomy groups were compared to each other and to the accepted pregnancy rate in the literature.

Results: A total of 63 patients met study inclusion criteria, including 41 and 22 in the orchiopexy and orchiectomy groups, respectively. The pregnancy rate in the orchiopexy and orchiectomy groups was 90.2% and 90.9%, respectively ($p = 1.0$). The accepted pregnancy rate in the general population is 82% to 92%. Mean \pm SD time to pregnancy in the orchiopexy and orchiectomy groups was 6.6 ± 5.50 and 7.2 ± 5.4 months, respectively ($p = 0.27$).

Conclusions: Several studies suggest decreased fertility potential in patients with a history of testicular torsion. However, in the current study in couples in which the male had a history of testicular torsion the pregnancy rate and the interval to pregnancy were within the accepted range of the general population.

Key Words: testis, spermatic cord torsion, time-to-pregnancy, orchiopexy, orchiectomy

To our knowledge the effect of TT on PR is unknown. Some authorities suggest that TT leads to male factor infertility.^{1,2} The main theories that have been suggested are a congenital abnormality of both testes that makes them prone to torsion, bilateral progressive testicular damage from recurrent episodes of transient

ischemia, the prophylactic maneuver of exploring and fixing the opposite testis or an autoimmune mechanism (sympathetic orchidopathy) elicited by the dying testis.^{3,4} Studies evaluating fertility following TT in animal models have produced conflicting results regarding female fecundity.⁵⁻⁷ Human studies have focused on

analyzing laboratory indexes such as semen analysis, histology of the contralateral testes during acute TT and hormonal levels of patients after TT.^{8,9} However, the results of these studies are conflicting and difficult to interpret.

The Jerusalem metropolitan area is unique in its population composition. A relatively high percent of ethnic Arabs and orthodox religious Jews live in this area. They have a relatively low incidence of emigration due to religious and social factors. Individuals in both of these societies marry at a relatively early age with the intent of immediate conception and they tend to have large families. Average age at matrimony in the Jerusalem metropolitan area is approximately 24 years for males according to the Central Bureau of Statistics (<http://cbs.gov.il/reader>). They tend to seek immediate medical advice in case of infertility. This makes the Jerusalem municipality a perfect laboratory for investigating the overall and live birth PRs after TT.

MATERIALS AND METHODS

Study Design

This is a retrospective observational study. Investigational review board approval was acquired for retrospective data collection (0505-14-HMO). We collected data on patients with TT who presented to our ER between January 1994 and December 2014. Unilateral TT was diagnosed by physical examination and duplex ultrasound, and confirmed by surgery.

Patients and Variables

This study included all patients older than 25 years who were in a relationship at least 1 year in duration and in whom a normal contralateral testis was detected on physical examination in the ER. We excluded all patients with known primary infertility, those unwilling to participate in the study and those with a history of undescended testis/varicocele.

Patients were contacted by telephone and all eligible candidates were interviewed according to a standardized questionnaire (see Appendix). The study parameters included the PR of live births, the interval to pregnancy from the decision to conceive to conception and asymmetrical testicular size based on self-examination. Oec was performed if there was no improvement in testicular color 20 minutes after detorsion and an incision made in the tunica albuginea showed no evidence of bleeding. In all patients TT symptoms were present for up to 96 hours.

Analysis

Statistical. Sample size was estimated to calculate a 95% CI for the percent of patients who were fertile after the procedure (Oec or Opx). The assumptions were that there would be at least 60 patients in the study and the fertility rate would be 87% (95% CI 75.4–94.1), representing the average PR in 2 prospective studies in the general population (table 1).^{10,11}

Table 1. Pregnancy rate of patients with TT history vs rate in literature

References	% Pregnancy	
	Orchiectomy	Orchiopexy
Highest known rates:		
Zinaman et al ¹⁰		82
Gnoth et al ¹¹		92
Present series	90.9	90.2
p Value (2-sided Fisher exact test) vs:		
Zinaman et al ¹⁰	0.383	0.252
Gnoth et al ¹¹	0.686	0.552

Data. Based on the empirical data a 95% CI was calculated for the PR. To compare the PR of the study group to that of the general population based on the previous studies^{10,11} the 1-sample chi-square test was applied. Quantitative variables were compared between 2 independent groups using the 2-tailed t-test. Categorical variables were compared in the groups by the Fisher exact or the chi-square test.

RESULTS

We identified 273 patients who presented to the ER between January 1994 and December 2014. The figure shows the patient distribution. There were 93 patients who were older than 25 years and married. Of these 93 patients 23 were excluded due to refusal to participate in 5, unreachable status in 14, surgery for undescended testis in childhood in 2 and left varicocele in 2. A total of 70 patients were married and older than 25 years, of whom 7 had been married less than 1 year and so were excluded from analysis. The remaining 63 patients had been married more than a year.

Detorsion of the affected testis with bilateral Opx was performed in 41 patients and Oec of the affected testis with contralateral Opx was done in 22 (table 2). The overall PR in the Oec and Opx groups was 90.9% and 90.2%, respectively ($p = 1.0$). The PR of live births was 87.8% and 86.3% in the Oec and Opx groups, respectively ($p = 1.0$). There was no statistical difference compared to the accepted PR cited in the medical literature (table 1).^{10,11} Mean \pm SD time to pregnancy in the Opx and Oec groups was 6.6 ± 5.5 and 7.2 ± 5.40 months, respectively ($p = 0.27$).

Left and right torsion occurred in 44 and 26 patients, respectively. There were 6 infertile men, including 4 in the Opx group and 2 in the Oec group. All female partners of the 6 infertile males were evaluated by a gynecologist and found to be fertile. Two infertile couples per group elected IVF, which was successful in 3 couples.

Two of the 4 patients who underwent Opx and were infertile had atrophy of the affected testis on testis self-examination, 1 had symmetrical testes and 1 refused to answer.

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