

## RESEARCH ARTICLE

### Analysis of causes and laparoscopic picture of tubal-peritoneal form of infertility in women of reproductive age

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#### ABSTRACT

**Background:** The study presents the data on the causal factors for development of tubal-peritoneal form of infertility (TPFI), as well as an enhanced laparoscopic picture of the uterus and appendages status in women of reproductive age. **Aims and Objective:** The purpose of the study is to determine the causes for development and give the enhanced laparoscopic picture of TPFI in women of reproductive age. **Materials and Methods:** An examination of 103 women was the basis for the research using anamnestic, general clinical, functional, and laparoscopic methods. **Result:** The factors of tubal peritoneal infertility in women include available extragenital diseases, urogenital infections, undertaken surgeries, inflammation of the uterus and appendages. The laparoscopic picture of the pelvic organs in women is made of available adhesions of various degrees, a change to fallopian tubes, ovaries, a uterine body, and available peritubal periovarian adhesions. **Conclusion:** TPFI in women of reproductive age in 88.6% cases develops against the background of an available extragenital pathology, in 69.6% cases against the background of urogenital infections, and in 77.3% cases against the background of previous surgeries on the pelvic and abdominal cavity organs. The laparoscopic picture of TPFI in women is described with significant pathological changes to the uterus and appendages and in 62.1% cases accompanied with a complete obstruction in fallopian tubes.

**KEY WORDS:** Tubal-peritoneal Form of Infertility; Laparoscopy; Adhesive Process


#### INTRODUCTION

In the structure of female infertility, the basic share (60-70%) belongs to the tubal-peritoneal factor.<sup>[1-3]</sup> The causes that lead to an appearance of the tubal-peritoneal form of infertility (TPFI) might be different. The main causes for tubal-peritoneal infertility (TPI) are inflammatory diseases in fallopian tubes, surgeries on the pelvic organs, infections in a genital tract, autoimmune processes.<sup>[4-8]</sup>

With repeated relapses of chronic salpingitis, adhesions occur that deform the tube and disturb its function.<sup>[9-12]</sup> Peritubal adherences in the pelvic cavity also occur after such interventions as oophorectomy, salpingectomy, reconstructive surgeries on uterine tubes, an excision of endometriosis heterotopias.<sup>[13-16]</sup> Despite numerous papers on mechanisms of TPI development, some etiological factors and clinical aspects have remained unsolved.<sup>[17,18]</sup> Our purpose is a factor analysis of clinical manifestations with confirmed TPFI in women of reproductive age.

#### MATERIALS AND METHODS

The object of the research included 103 women from all regions of the Kyrgyz Republic in their reproductive age and with TPFB diagnosis confirmed with clinical

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findings, such as ultrasound examination of pelvic organs, hysterosalpingography, and diagnostic laparoscopy with the consent of each subject. The laparoscopy was performed using the Richard Wolf Kaze Store - Endoscope (Germany) equipment and a monitor by Panasonic (Japan). Prevalence and severity of the adhesive process were assessed with the Hulka's classification (1998).<sup>[19]</sup> Statistical data are presented in absolute and percentage values. The study was conducted in accordance with the Declaration of Helsinki. Information can be obtained through the reports of the Kyrgyz Scientific Centre for Human Reproduction.

## RESULTS

An average age of women was  $33.1 \pm 4.6$  years. No pregnancy was the main complaint of the patients. Moreover, primary infertility, i.e., 67.9% (70 women) prevailed over secondary, i.e., 31.7% (33 women). A period of infertility in women (Table 1) with the 1<sup>st</sup> degree of the adhesive process was mostly up to 3 years (71.4%), then 5 years (28.5%). For the 2<sup>nd</sup> degree, this ratio was 55.7% and 34%, and over 5 years - 9%. For the 3<sup>rd</sup> degree, these values were accordingly 21.7%, 65.2%, and 13%; for the 4<sup>th</sup> degree, the infertility period was up to 5 years in 25%, and over 5 years in 75%.

In the examination time, 20.5% of patients suffered from various disorders in their gastrointestinal tract, 19% from disorders in their urinary system, 18% from various allergic diseases; while in 12.3% of women, cardiovascular diseases were identified, and in 10.3% of women, chronic diseases of the respiratory system were identified. There was also obvious a diffuse enlargement of the thyroid gland in 8.5% women. This is because our republic is an iodine-deficient region and this leads to hypothyroidism available in a significant number of people.

An examination for available urogenital infections in women with TPFI shows that only in 31 women (30%), no infections were reveal. Cases of two or more associated infections were found in 23.84% women (27 women). There were observed associations of chlamydia, ureaplasma, and mycoplasma (7.7%); chlamydia and simple herpes virus

(5.8%); chlamydia and *Gardnerella* (5.8%); *Gardnerella*, ureaplasma, mycoplasma (2.9%); simple herpes virus, ureaplasma, and mycoplasma (1.9%). Mono-infections were found in 47 women (36.48%).

An important factor in the TPFI development is surgeries in a medical history related to the pelvic organs and the abdominal cavity. Among them, appendectomy (15.5%) has the highest percentage, as well as artificial abortions (13.59%), ectopic pregnancy (11.65%), cystectomy 9.7%, miscarriage (8%), cesarean section (8%), and a combination of several surgeries (5%).

In the most cases, TPI develops against the background of various inflammatory gynecological diseases, which often follow each other (salpingo-oophoritis, ovarian cysts, metroendometrites, hydro- and salto-salpinx, etc.) In total, among the examined women, 77.3% (80 women) had some or other diseases of the uterus and appendages, which makes these diseases important in infertility development.

The diagnostic laparoscopy made it possible to confirm the available adhesive process in case of TPFI in women in 100% cases (Table 2). As shown in Table 2, in the most cases (62.1%), in the women, there was no revealed pathology in the anterior and posterior cul-de-sac, but adhesions were found in 30% cases while endometriosis symptoms in 7.76%. Available adhesions in sacrouterine ligaments with neighboring organs were revealed in 53.39% cases. A change to the ovarian capsule in terms of density and expressiveness of the pattern was found in 11.65%, while at the same time, the ovarian peritoneum in 58.2% consisted of adhesions and in 3.88% of endometriosis focuses. Expressiveness of the adhesive process in the ovaries was mainly of the first and the second degree (69.88%) and the fourth degree, the least (7.76%).

Uterine tubes were all along visualized in 62.1% cases, while in 37.85%, they were visualized in part or not visualized at all. In 27.18% of women, an expansion of uterine tubes all along was found; at the same time, the expansion in the ampulla was available in 33.98%. A color of the uterine tubes was mainly normal (40.7%) and hyperemic (50.48%), while in 8.73% cases, it had a cyanotic character. The thickness of uterus tubes was predominantly thickened (63.2%). A lack of fimbriae in the uterus tubes was found in 35.9% cases. The adhesive process in the uterus tubes mainly consisted of peritubal adhesions with ovary, uterus, intestinal tract, and pelvic peritoneum in 61.2% cases. Periovarian adhesions were available in 35% cases. In time of laparoscopy, chromohydrotubation was performed to evaluate uterine tubal patency. In the most cases, there was no penetration of the contrast into a uterine tube (62.1%); voluminous pouring-out was observed in 8.73%, and a weak pouring-out was observed in 19.41%. Penetration of the contrast into the uterus tube without pouring out was registered in 9.7% cases.

**Table 1: Infertility period in women with TPFI**

Infertility period (years)	Absolute (%)			
	Degree of the adhesive process in women's pelvis			
	I (n=28)	II (n=44)	III (n=23)	IV (n=8)
1	3 (10.7)	5 (11.3)	1 (4.3)	-
1-3	17 (60.7)	20 (45.4)	4 (17.4)	-
3-5	8 (28.5)	15 (34.0)	15 (65.2)	2 (25.0)
Over 5	-	4 (9.0)	3 (13)	6 (75.0)

TPFI: Tubal-peritoneal form of infertility

**Table 2: Laparoscopic picture in women with TPGI**

Indicators of laparoscopic examination	Absolute (%)
Uterine space	
Without pathology	64 (62.13)
Endometriosis	8 (7.77)
Adhesions	31 (30.10)
Adhesive process in uterosacral ligaments	
No	48 (46.60)
Available	55 (53.40)
Ovaries	
State of capsule	
Normal	42 (40.78)
Changed	61 (50.22)
Cystic changes	12 (11.65)
Peritoneum in ovaries	
Normal	39 (37.86)
Endometriosis	4 (3.88)
Adhesions	60 (58.26)
Adhesive process in ovaries	
1 <sup>st</sup> degree	28 (27.18)
2 <sup>nd</sup> degree	44 (42.72)
3 <sup>rd</sup> degree	23 (22.33)
4 <sup>th</sup> degree	8 (7.77)
State of uterine tubes	
Visualized	
All along	64 (62.14)
In part	11 (10.68)
Is not visualized	28 (27.18)
Form of the uterine tube	
Normal	40 (38.83)
Increased all along	28 (28.18)
Increased in ampulla	35 (33.99)
Color of the uterine tube	
Normal	42 (40.78)
Hyperemic	52 (50.49)
Cyanotic	9 (8.73)
Wall thickness	
Normal	38 (36.89)
Thickened	65 (63.11)
Fimbriae evidence	
No	37 (35.92)
Available	66 (64.08)
Adhesive process in uterine body	
No	38 (36.89)
Available	65 (63.11)
Peritubal adhesions	
No	40 (38.83)
Available	63 (61.17)
Periovarian adhesions	
No	67 (65.05)
Available	36 (34.95)

## DISCUSSION

The presented data show that the longer infertility is that the more expressed a degree of the adhesive process is in the small pelvis and of the tubal-peritoneal factor. Available urogenital infections in the most women are dangerous in terms of the infertility occurrence, as from a contamination moment until the first visit to clinics because of infertility months and years might come, when there are no diagnostication and treatment. Surgeries suffered by 77.3% women on their pelvic organs and organs in the abdominal cavity are a starting point for the development of post-surgical adhesions in the small pelvis because of a damage to the peritoneum leading to ischemia of tissues, a decrease in the local fibrinolytic activity of tissues with a following inflammatory response of the uterus and appendages. The TPGI laparoscopic picture has shown available significant changes to the morphology of the uterus and appendages; the major among them is an available obstruction of the uterus tubes and periovarian adhesions. Accordingly, the available marked adhesive process in the small pelvis causes a need in salpingo-ovariolysis, salpingostomy, and fimbriolysis in time of the laparoscopy treatment. Comorbidity in the form of endometriosis and cystic changes to the ovaries are a reason to have cauterization of the ovaries capsule and endometriosis coagulation.

## CONCLUSION

This is the tubal-peritoneal factor in the structure of female infertility that determines a need in the diagnostic laparoscopy for women with infertility longer than 1 year. This would prevent progress in the development of the adhesive process in the small pelvis and give a favorable prognosis to restore fertility.

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