

## Comparative Endoscopic Characteristic of the Fallopian Tubes Assessment in Women with Infertility Combined with Reproductive Diseases

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**Abstract:** Female infertility in marriage is one of the most urgent problems of modern gynecology. The present study was carried out in the Astana Perinatal Center No. 1 Gynecology Department (Republic of Kazakhstan) for the period from 2014-2016. We examined 200 patients and divided them into three groups: Group 1 included patients with endometriosis and infertility (n = 56), Group 2 consisted of patients with hysterosarcoma and infertility (n = 54), Group 3 was made by patients with chronic salpingitis and infertility (n = 90). Considering the presence of patients with infertility combined with reproductive diseases, the frequency of tubal pathology in three groups was from 60.71-85.56%, despite their bilateral tubal patency from 57.41-73.21%. The optimal complex of tubal pathology diagnostics that determines the choice of laparoscopic treatment method for infertility in conjunction with reproductive disorders should include first of all hysterosalpingography. Laparoscopy in particular the Sonographic Hydrotubation (SHT) with dye test (chrome) gives 75% of results of the tubal patency condition. Laparoscopy interventions involves a risk of abdominal cavity internal organs injury.

**Key words:** Infertility, endometriosis, hysterosarcoma, chronic salpingitis, fallopian tube

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### INTRODUCTION

The problem of reproductive dysfunction is one of the most actual problem in modern gynecology. Female infertility in marriage is one of the most urgent problems of modern gynecology.

Tubal and peritoneal factor, the frequency of which doesn't tend to decrease to 50-60% (Kulakova, 2005) is the leading reason of female infertility. This is related to an increase in uterine annexes inflammatory diseases. However, it is not excluded that the fallopian tubes distractions are related to the reproductive organs primary diseases. Their influence on the fallopian tubes condition is of interest in connection with carrying out organ-preserving surgeries, reproductive technologies and remedial treatment (Makhotina, 2010; Kvitsiani, 2010; Aziev, 1993).

In this regard, issues of the fallopian tubes diagnosis are very important in developing endoscopic methods in infertile women (Kuzemina, 1999; Lundberg *et al.*, 1998). Objective of the study is to determine the fallopian tubes destruction and to assess uterine tubes condition in women with infertility in combination with reproductive diseases.

### MATERIALS AND METHODS

The present study was carried out in the Astana Perinatal Center No. 1 Gynecology Department (Republic of Kazakhstan) for the period from 2014-2016. We examined 200 patients and divided them into three groups: Group 1 included patients with endometriosis and infertility (n = 56), Group 2 consisted of patients with hysterosarcoma and infertility (n = 54), Group 3 was made by patients with chronic salpingitis and infertility (n = 90).

All patients passed a standard examination (anamnesis (questioning), general-clinical examination, pelvic organs ultrasound examination, laparoscopy). The exclusion criteria were polycystic ovarian syndrome and male infertility. The obtained data were statistically processed using “Microsoft Excel” and “SPSS Statistics No. 22” software package.

### RESULTS AND DISCUSSION

Data analysis showed that distinctions between groups are statistically reliable on Bonferroni ( $p = 0.5$ ) at ( $p < 0.05$ ), groups were comparable based on this indicator.

Table 1: A menstrual and sexual functions is in the age-related aspect

Variables	Groups		
	1	2	3
Age (average) (years)	33.5+5.1	35.8+4.75	32.7+5.0
Menarche (average) (years)	13.4+1.30	13.4+1.25	13.5+3.87
Duration of menstrual bleedings (averaged) (days)	5.16+1.15	5.09+1.12	4.85+1.09
The menstrual cycle length (days)	28.4+3.47	30.6+7.69	29.67+5.8
<b>Menstrual dysfunction</b>			
Hyperpolymenorrhea (%)	4 (30.77+12.80)	10 (18.52+5.29)	2 (2.22+1.55)
Dysmenorrhea (%)	10 (45.45+10.62)	6 (11.11+4.28)	4 (4.44+2.17)
Dyspareunia (%)	2 (9.09+6.13)	-	-
Opsomenorrhea	2 (15.38+10.0)	6 (11.11+4.28)	6 (6.67+2.63)
Pre- and postmenstrual spotting (%)	5 (38.46+13.49)	-	-
Sexual function (averaged) (years)	20.75+3.29	21.59+4.5	20.27+2.9

Table 2: Outcomes of pregnancy in women with secondary infertility

Groups	Outcomes of pregnancy in women with secondary infertility (%)				
	Induced abortion	Spontaneous abortion	Urgent labor	Operative delivery	Ectopic pregnancy
1 group M±m; n = 23	9 (16.07+4.91)	11 (19.64+5.31)	14 (25.0+5.79)	2 (3.57+2.48)	1 (4.35+4.25)
2 group M±m; n = 28	18 (64.29+9.05)	9 (32.14+8.83)	13 (46.43+9.42)	1 (3.57+3.51)	7 (12.96+4.57)
3 group M±m; n = 51	17 (18.89+4.13)	23 (25.56+4.60)	21 (23.3+4.46)	3 (3.33+1.89)	3 (3.33+1.89)

p<0.05 within the group

**Reproductive function:** Patients of the 1 group noted the absence of pregnancy within 1-16 year with regular sexual life. Primary infertility was in 33 women, secondary in 23. Duration of primary infertility averaged 3.5+2.3 year. Duration of secondary varied from 1-16 year (on average 3.5+3.15).

Patients of the 2 group noted the absence of pregnancy within 1-14 year with regular sexual life. Primary infertility was in 26 women, secondary in 28. Duration of primary infertility averaged 4.28+3.3 year. Duration of secondary varied from 1-14 year (on average 5.17+3.46).

Patients of the 3 group noted the absence of pregnancy within 1 year and more with regular sexual life. Primary infertility was in 40 women, secondary in 50. Duration of primary infertility averaged 5.12+3.76 year. Duration of secondary varied from 1.5-15 year (on average 4.84+3.16) (Table 1). Outcomes of pregnancy in women with second infertility are shown in Table 2 after examination of their reproductive functions.

Thus, the pregnancy outcome in women with secondary infertility were in 25% of patients with endometriosis, 46.43% with hysteromyoma, 23.3% with chronic salpingitis. Pregnancy that ends with timely delivery occurs 2 time higher in women with hysteromyoma.

According to the frequency of extragenital diseases in women form the 1st group: diseases of respiratory organs were in 4% (7.14+3.44) of cases, digestive organs in 5% (8.93+3.81), urinary system in 2% (3.57+2.48), infectious diseases in 2% (3.57+2.48), diseases of thyroid gland in 5% (8.93+3.81), obesity in 1% (1.79+1.77). In the 2nd group respiratory organs diseases were in 1% (1.11+1.10) of cases, digestive organs in 4%

(7.41+3.56), cardiovascular system in 1% (1.85+1.83), diseases of thyroid gland in 5% (9.26+3.94), obesity in 2% (3.7+2.57). In the 3rd group respiratory organs diseases were in 1% (2.56+2.53), digestive organs in 5% (5.56+2.42), urinary system in 4% (4.44+2.17), diseases of thyroid gland in 18% (20.00+4.22), obesity in 2% (2.22+1.55) of cases.

The analysis of concomitant extragenital pathology frequency in the examined groups showed that the most frequently detected pathology in patients with infertility in combination with chronic salpingitis is endocrine system diseases (diseases of thyroid gland 20.0%). According to other indicators of statistical differences on Bonferroni-corrected Student method was (p = 0.48) at (p<0.05) that meant groups were comparable based on this indicator. In the frame of concomitant gynecologic pathology in the 1st group: endometrium pathology was in 5% (8.93+3.81) of patients, ovarian cysts in 12% (21.43+5.48), fallopian tubes pathology in 8% (14.29+4.68), cervical erosion in 7% (12.50+4.42), hysteromyoma in 2% (3.57+2.48), synechiae in the uterine cavity in 2% (3.57+2.48), cervical canal polyp in 1% (1.79+1.77) of as well as sexually transmitted infections in 10% (17.86+5.12) of cases.

**In the 2nd group:** Endometrium pathology was in 5% (9.26+3.94) of cases, ovarian cysts in 6% (11.11+4.28), endometriosis 1% (1.85+1.83), fallopian tubes pathology in 6% (11.11+4.28). Cervical erosion in 7% (12.96+4.57), cervical canal polyp in 1% (1.85+1.83). As well as sexually transmitted infections in 6% (11.11+4.28) patients.

**In the 3rd group:** Endometrium pathology was in 8% (8.89+3.0) of patients. ovarian cysts in 7% (7.78+2.82),

fallopian tubes pathology in 8% (8.89+3.0). Cervical erosion in 8% (8.89+3.0). Adhesion process 13% (14.44+3.71) as well as sexually transmitted infections in 18% (20.0+4.22) cases.

Analysis of concurrent gynecological diseases demonstrated that the fallopian tubes pathology in all groups were caused by sexually transmitted infections. Among surgeries according to the anamnesis of the 1st group: appendectomy was in 9% (16.07+4.9) of patients. cesarean section in 2% (3.57+2.48). Cystectomy in 3% (5.36+3.01), laparoscopy, salpingoovariolysis in 2% (3.57+2.48), salpingoplasty in 2% (3.57+2.48). laparoscopy. tubectomy in 1% (1.79+1.77), hysteroscopy, polypectomy in 2% (3.57+2.48), hystero-resectoscopy in 2% (3.57+2.48) cases.

**In the 2nd group:** Appendectomy was in 4% (7.41+3.56), cesarean section in 1% (1.85+1.83), cystectomy in 4% (7.41+3.56), laparoscopy, salpingoovariolysis in 4% (7.41+3.56), laparoscopy, salpingoplasty in 2% (3.70+2.57), tubectomy in 7% (12.96+4.57), ovariectomy in 1% (1.85+1.83), cholecystectomy in 2% (3.70+2.57) of patients.

**In the 3rd group:** Appendectomy was in 6% (6.67+2.63), cesarean section in 3% (3.33+1.89), cystectomy in 5% (5.56+2.42), laparoscopy, salpingoovariolysis in 2% (2.22+1.55), salpingoplasty in 3% (3.33+1.89), hysteroscopy, polypectomy in 3% (3.33+1.89), tubectomy in 3% (3.33+1.89), cholecystectomy in 1% (1.11+1.10) of cases.

On the frequency of disease's clinical implications in the 1st group the pain syndrome was in 22% (39.29+6.53), menstrual dysfunction in 13% (23.21+5.64) cases. In the 2nd group the pain syndrome was in 14% (25.93+5.96), menstrual dysfunction in 16% (29.63+6.21) of cases. In the 3rd group the pain syndrome was in 15% (16.67+3.93), menstrual dysfunction in 8% (8.89+3.00) of cases.

In conducting pelvic ultrasound in the 1st group we detected ovarian cysts in 26% (46.43+6.66), adenomyosis in 3% (5.36+3.01), hydrosalpinx in 3% (5.36+3.01), hysteromyoma in 3% (5.36+3.01), chronic salpingitis in 2% (15.38+10.1), endometrium pathology in 5% (8.93+3.81) of patients. In the 2nd group ovarian cysts were in 7% (12.96+4.57), adenomyosis in 1% (1.85+1.83), hydrosalpinx in 7% (12.96+4.57), hysteromyoma in 36% (66.67+6.41), chronic salpingitis in 4% (7.41+3.56), endometrium pathology in 5% (9.26+3.94), cervical canal polyp in 3% (5.56+3.12), cervix cyst in 3% (5.56+3.12), pelvic adhesion process in 2% (3.70+2.57) of cases. In the 3rd group ovarian cysts were in 14% (15.56+3.82), adenomyosis in 5% (5.56+2.42), hydrosalpinx in 21% (23.33+4.46), hysteromyoma in 3% (3.33+1.89), chronic salpingitis in 5% (5.56+2.42), endometrium

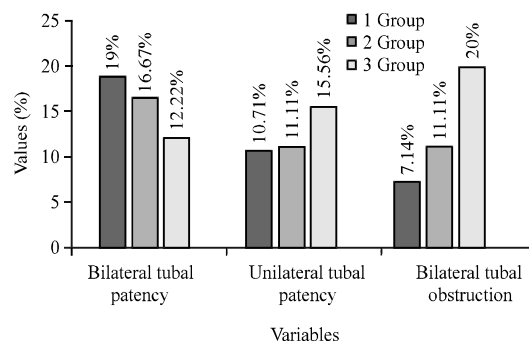


Fig. 1: Tubal patency characteristic according to the hysterosalpingography at the examined women

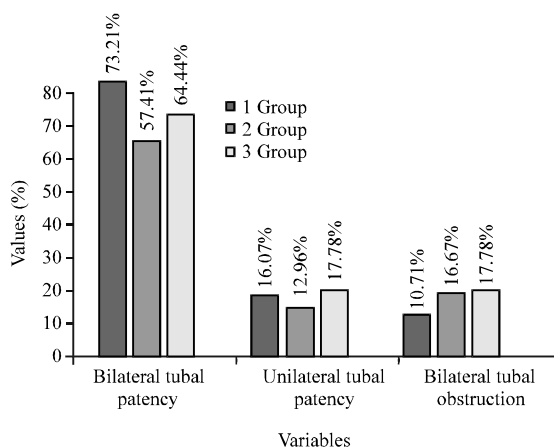


Fig. 2: Tubal patency characteristic according to the hysterosalpingography data in the examined women

pathology in 5% (5.56+2.42), endometrium does not match the phase of the menstrual cycle in 4% (4.44+2.17), adhesion process in 8% (8.89+3.0) of cases. According to data, hysterosalpingography in the examined women is presented Fig. 1.

Data analysis showed that according to Bonferroni at  $p = 0.41$  ( $p < 0.05$ ), there were no any statistical differences. According to data, Sonographic Hydrotubation (SHT) with dye test (chrome) in the examined women is presented in Fig. 2.

Using data from these three groups when comparing the tubal patency characteristics according to Sonographic Hydrotubation (SHT) with dye test (chrome) data among the examined women by Bonferroni  $p = 1.0$  at ( $p < 0.05$ ), showed that there were no any significant differences between three groups.

The detected pelvic pathologies after laparoscopy among the examined patients: in the 1st group: endometriotic heterotopia in vesicouterine was in

2% (3.57+2.48), endometriotic heterotopia in sacro-uterine ligaments in 4% (7.14+3.44), endometriotic heterotopia in small pelvis peritoneum in 10% (17.86+5.12), endometriotic heterotopia in behind-uterine space in 9% (16.07+4.91), endometriotic foci on the ovaries surface in 8% (14.29+4.68), fallopian tubes endometriosis in 2% (3.57+2.48), endometriotic cysts in 30% (53.57+6.66), adenomyosis in 8% (14.29+4.68), hystero-myoma in 3% (5.36+3.01), chronic salpingitis in 3% (5.36+3.01), ovarian and fallopian tube agenesis in 1% (1.79+1.77), adhesion process in 8% (14.29+4.68) of the examined women.

**In the 2nd group:** Endometriotic heterotopia was in sacro-uterine ligaments in 2% (3.70+2.57), endometriotic cysts in 4% (7.41+3.56), adenomyosis in 2% (3.70+2.57), dermoid cysts in 1% (1.85+1.83), hydrosalpinx in 10% (18.52+5.29), bicornuate uterus in 1% (1.85+1.83), adhesion process in 8% (14.81+4.83) of patients.

**In the 3rd group:** Endometriotic heterotopia in vesicouterine was in 2% (2.22+1.55), endometriotic heterotopia in sacro-uterine ligaments in 1% (1.11+1.10), endometriotic cysts in 1% (1.11+1.10), follicular cysts in 2% (2.22+1.55), parovarian cysts in 2% (2.22+1.55), hystero-myoma in 2% (2.22+1.55), hydrosalpinx in 10% (11.11+3.3), bicornuate uterus in 1% (1.11+1.10), nodular salpingitis in 6% (6.67+2.63), adhesion process in 33% (36.67+5.08) of cases.

The volume of surgical interventions during therapeutic and diagnostic laparoscopy carried out among the examined patients: in the 1st group: laser coagulation of endometriotic heterotopia foci in the peritoneum in was in 10% (17.86+5.12) of patients, laser coagulation of endometriotic heterotopia foci in behind-uterine space in 9% (16.07+4.91), laser coagulation of endometriotic heterotopia foci in vesicouterine in 2% (3.57+2.48), laser coagulation of endometriotic heterotopia foci in sacro-uterine ligaments in 2% (3.57+2.48), ovarian surface endometriotic heterotopia excision in 8% (14.29+4.68), fallopian tubes endometriotic heterotopia excision in 2% (3.57+2.48), conservative myomectomy in 2% (3.57+2.48), cystectomy in 30% (53.57+6.66), adhesiolysis in 9% (16.07+4.91), salpingo-ovariectomy in 6% (10.71+4.13), salpingoplasty in 3% (5.36+3.01), fimbrioplasty in 2% (3.57+2.48) of cases.

**In the 2nd group:** Laser coagulation of endometriotic heterotopia foci in sacro-uterine ligaments was in 2% (3.70+2.57) of women, conservative myomectomy in 49% (90.74+4.83), conservative myomectomy abstinence in 4% (7.41+3.56), hystero-resectoscopy

in 1% (1.85+1.83), cystectomy in 4% (7.41+3.56), adhesiolysis in 8% (14.81+4.83), salpingo-ovariectomy in 7% (12.96+4.57), salpingoplasty in 4% (7.41+3.56), fimbrioplasty in 2% (3.70+2.57), tubectomy in 9% (16.67+5.07) of patients.

**In the 3rd group:** laser coagulation of endometriotic heterotopia foci in vesicouterine was in 2% (2.22+1.55) of cases, laser coagulation of endometriotic heterotopia foci in sacro-uterine ligaments in 1% (1.11+1.10), conservative myomectomy in 2% (2.22+1.55), cystectomy in 4% (4.44+2.17), adhesiolysis in 8% (8.89+3.0), salpingo-ovariectomy in 21% (23.33+4.46), salpingoplasty in 11% (12.22+3.45), fimbrioplasty in 2% (2.22+1.55), tubectomy in 5% (5.56+2.42) of patients.

Changes among patients from the 1st group were observed in 34% (60.71+6.53) of women during tubal laparoscopy. The following changes were the most frequent: nodular salpingitis in 3% (5.36+3.01) of cases, tube injected in 3% (5.36+3.01), tube hydrosalpinx in 2% (3.57+2.48), "beads" type tube in 4% (7.14+3.44), tube peritubular adhesions in 15% (26.79+5.92), tube in endometriosis macules in 2% (3.57+2.48), tube nodular salpingitis+tube hydrosalpinx in 1% (1.79+1.77), "beads" type tube+tube peritubular adhesions in 3% (5.36+3.01), tube peritubular adhesions+tube hydrosalpinx in 1% (1.79+1.77) of patients.

Changes in the 2nd group were observed in 33% (61.11+6.63) of cases. The following changes were the most frequent: nodular salpingitis in 5% (9.26+3.94) of women, tube injected in 3% (5.36+3.12), tube hydrosalpinx in 10% (18.52+5.29), "beads" type tube in 1% (1.85+1.83), tube peritubular adhesions in 7% (12.96+4.57), tube in endometriosis macules in 2% (3.70+2.57), tube nodular salpingitis+tube hydrosalpinx in 2% (3.70+2.57), "beads" type tube+tube peritubular adhesions in 1% (1.85+1.83), tube peritubular adhesions+tube hydrosalpinx in 2% (3.70+2.57) of patients.

Changes in the 3rd group were observed in 77% (85.56+3.71) of cases. The following changes were the most frequent: nodular salpingitis in 6% (6.67+2.63) of patients, tube injected in 7% (7.78+2.82), tube hydrosalpinx in 10% (11.11+3.31), "beads" type tube in 4% (4.44+2.17), tube peritubular adhesions in 34% (37.78+5.11), tube nodular salpingitis+tube hydrosalpinx in 5% (5.56+2.42), "beads" type tube+tube peritubular adhesions in 7% (7.78+2.82), tube peritubular adhesions+tube hydrosalpinx in 4% (4.44+2.17) of patients.

Considering the presence of patients with infertility combined with reproductive diseases, the frequency of tubal pathology in three groups was from 60.71-85.56%, despite their bilateral tubal patency from 57.41-73.21%.

## **CONCLUSION**

The optimal complex of tubal pathology diagnostics that determines the choice of laparoscopic treatment method for infertility in conjunction with reproductive disorders should include first of all hysterosalpingography. Laparoscopy in particular the Sonographic Hydrotubation (SHT) with dye test (chrome) gives 75% of results of the tubal patency condition. Laparoscopy interventions involves a risk of abdominal cavity internal organs injury.

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