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Abdominal Laparoscopic Findings in Patients with Primary Infertility Versus Patients with Secondary Infertility

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Abstract

Infertility is failure to conceive for one year despite regular unprotected intercourse. Primary infertility: when pregnancy never occurred. Secondary infertility: when pregnancy occurred then followed by infertility interval. Objective: compare laparoscopic findings in patients with primary infertility and patients with secondary infertility. Study design: retrospective study on patients with primary and secondary infertility who had diagnostic laparoscopy between January 2018 and December 2019. Setting: gynecological department at al Amal hospital, Amman, Jordan.

Method: *medical records and information of 300 patients were reviewed retrospectively and data were extracted by an experienced clinician* ***(****The Author****).****129 patients were included into inclusion criteria. Two groups of patients were identified, and comparison was made between women with primary infertility* ***(****51****)*** *and women with secondary infertility* ***(****78****)****. Results: tubal defect was found in 31.8% of all cases in the study, endometriosis was the most common findings in patients with primary infertility by 32.8% , tubal defect and adhesions was found in equal percentage in patients with secondary infertility by 34%.*

Results: *The study included a total 129 patients with infertility, with mean ± SD age of 32 ±5,94 . - The mean duration of years of infertility was: 3,73 ± 2,45. - The sample was divided into 2 groups: group* ***(****A****)*** *with primary infertility, group* ***(****B****)*** *with secondary infertility. - Some patients in the study have more than one finding in laparoscopy which give a result of 176 findings in total.*

Introduction

According to WHO (world health organization) positive reproductive health of a woman is a state of complete physical, mental and social wellbeing and not merely the absence of disease related to reproductive system and functions. Infertility means failure of a couple to achieve pregnancy after 1year of unprotected and regular intercourse, which is an indication to for investigations, while sterility means absolute inability to conceive for one or more reasons (1). Primary infertility: when conception has never occurred before. Secondary infertility: if the woman failed to conceive after having achieved a previous conception. partners who are concerned about their fertility should be informed that over 80% of couples in the general population will conceive within 1year if the woman age less than 40 years and they do not use contraception and have regular sexual intercourse. Of those who do not conceive in the first year, about half will do so in the second year (cumulative pregnancy rate over 90%). Couples who experience problems in conceiving should be seen together because both partners are affected by decisions surrounding investigation and treatment. The lifetime incidence of infertility is widely reported to be 17% (1 in 6 couples) however the incidence and prevalence has been shown to vary significantly depending on the population studied and methodology used to define infertility (2). In 2020, fertility rate for Jordan was 2.8 children per woman (3). Fertility rate of Jordan fell gradually from 7.93 children per woman in 1970 to 2.69 children per woman in 2019. (4) There are few statistics regarding the infertility rate in Jordan, due to social issues and medical insurance.

Causes of infertility: 1- Unexplained infertility (25-30%) 2- Male factor (20-30%) 3- Female factor (30-50%) which include (anovulation 11-30%, tubal factor 11- 30%, endometriosis 5-10%, abnormal anatomy 5-30%) 4- Both male and female (40%) (5)

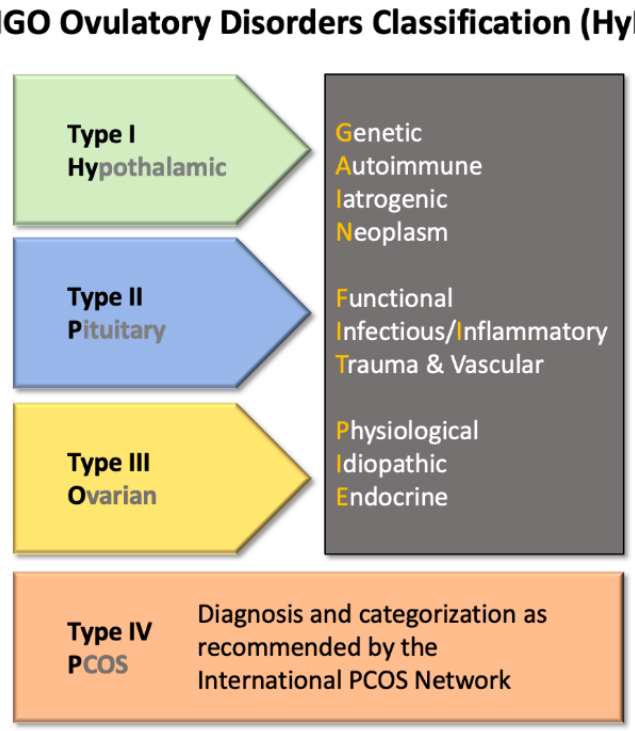
The World Health Organization (WHO) classifies ovulation disorders into 3 groups:

Group I: hypothalamic pituitary failure (hypothalamic amenorrhea or hypo gonadotrophic hypogonadism) usually women present with amenorrhea (primary or secondary) which is characterized by low gonadotropins and oestrogen deficiency, approximately 10% of women with ovulation disorders have a group I ovulation disorder.

Group II: hypothalamic-pituitary-ovarian dysfunction (predominately polycystic ovary syndrome) and hyperprolactinaemic amenorrhea, around 85% of women with ovulation disorders have a group II ovulation disorder, which is the most common type of ovulation disorder.

Group III: ovarian failure, around 5% of women with ovulation disorders have a group III ovulation disorder. **(**6**)**

New Figo classification 2022(7**)**



Pcos (polycstic ovarian syndrome): Stein and Leventhal at in 1935 reported a series of seven women with polycystic ovaries and oligo/amenorrhoea, later to be known as PCOS. **(**8**)** they described several women presenting with oligo/amenorrhoea combined with the presence of bilateral polycystic ovaries **(**PCO**)** established during surgery. Three of these seven women also presented with obesity, while five showed signs of hirsutism. Only one woman was both obese and showed hirsutism. These findings imply that in case PCO is diagnosed by morphology in women with oligo/anovulation, not all the features which are believed to be associated with PCOS need to be present.**(**9**)** PCOS is one of the most common endocrine disorders in women of reproductive age , Because of differences in the diagnostic criteria employed, prevalence estimates vary widely, ranging from 2.2% to as high as 26%, PCOS is a common disorder, often complicated by chronic anovulatory infertility and hyperandrogenism with the clinical manifestations of oligomenorrhoea , hirsutism and acne , Many women with this condition are obese and have a higher prevalence of impaired glucose tolerance, type II diabetes and sleep apnia than is observed in the general population. They exhibit an adverse cardiovascular risk profile,

characteristic of the cardio metabolic syndrome as suggested by a higher reported incidence of hypertension, dyslipidaemia, visceral obesity, insulin resistance and hyperinsulinemia. **(**10**)** The Rotterdam criteria have suggested a broader definition for PCOS, with two out of three of the following criteria being diagnostic of the condition: 1. polycystic ovaries **(**either 12 or more follicles or increased ovarian volume > 10 cm3**)** 2. oligo-ovulation or anovulation. 3. Clinical and/or biochemical signs of hyperandrogenism **(**11**)**

Unexplained subfertility: is usually diagnosed if a couple fails to conceive after 1 year of regular unprotected sexual intercourse even though investigations for ovulation, tubal patency and semen analysis are normal. prognosis depends on the age of the female partner, duration of subfertility and previous obstetric history. Differences of opinion exist among fertility specialists regarding the optimal treatment for couples experiencing unexplained subfertility. As the female partners age increases, there is a decline in the total number of remaining oocytes and their quality, because of the decline in oocyte quality there is an increase in the embryonic aneuploidy rate in older women which leads to no implantation and subfertility in women over 35 years of age. Potential contributing factors for subfertility: 1. Low ovarian reserve. 2. Increased age **(**over 35 years**)** and low oocyte quality. 3. Lifestyle factors **(**smoking, excessive alcohol intake, weight**)**. 4. Tubal function defects 5. Fertilization defects. 6. Implantation defects. 7. Metabolic disorders, immunological and genetic factors. 8. Endometriosis. 9. Fibroids. 10. Adenomyosis. **(**11**)** Endometriosis: Endometriosis is the presence of endometrium at a site outside the endometrial lining, this condition was first described by Carl Von Roisters in 1860, Endometriosis is a proliferative hormone-dependent disease of the childbearing period. It is extremely rare before menarche and disappears after menopause. Dysmenorrhea, chronic pelvic pain, deep dyspareunia, cyclical intestinal complaints, postcoital bleeding, ovarian cyst fatigue/weariness and infertility continue to be the leading symptoms of endometriosis. The symptoms of endometriosis depend on the location of the disease. Deep endometriosis of the posterior pelvis is associated with increased severity of dyschezia and dyspareunia in comparison to women with pelvic endometriosis without posterior deep endometriosis. **(**12**)**

Several theories have been introduced to explain endometriosis the main theories are the following: 1-implantation theory: Sampson's pioneering work in 1922 attributed endometriosis to reflux of menstrual endometrium through the fallopian tubes and its subsequent implantation and growth on the pelvic peritoneum and the surrounding structures. 2-coelomic metaplasia theory: Meyer and Ivanoff **(**1919**)** propounded that endometriosis result of metaplastic changes in embryonic mesothelium. 3-metastatic theory: it was suggested by halban et al **(**1924**)** that embolization of menstrual fragments

occurs through vascular or lymphatic channels and this leads to the launching of endometriosis at distal sites. **(**13**)**

Laparoscopy in the diagnosis of endometriosis: In women with symptoms and signs of endometriosis there is an argument for starting medical treatment before embarking on an invasive procedure like a laparoscopy to obtain histological proof of the disease. The combination of laparoscopy and the histological verification of endometrial glands and/or stroma is considered to be the gold standard for the diagnosis of the disease. In many cases the typical appearances of endometriotic implants in the abdominal cavity are regarded as proof that endometriosis is present **(**powder burn lesions, superficial endometriosis with adjacent puckering, and ovarian cyst with tarry, thick, chocolate-coloured fluid content**)**

A good quality laparoscopy should include systematic checking of: 1**)** the uterus and adnexa. 2**)** the peritoneum of ovarian fossae, vesico-uterine fold, Douglas and pararectal spaces. 3**)** the rectum and sigmoid **(**isolated sigmoid nodules**)**. 4**)** the appendix and caecum. 5**)** the diaphragm.

There should also be a speculum examination and palpation of the vagina and cervix under laparoscopic control, to check for 'buried' nodules. Clinicians may consider both ablation and excision of peritoneal endometriosis to reduce endometriosis-associated pain. In women with minimal to mild endometriosis **(**rASRM classification**)**, operative laparoscopy including adhesiolysis is effective in increasing the pregnancy/live birth rate, compared to diagnostic laparoscopy in infertile women with AFS/ASRM stage III/IV endometriosis, clinicians can consider operative laparoscopy, instead of expectant management, to increase spontaneous pregnancy rates. **(**14**)**

Investigation for infertile couples: For male partner: 1- Semen analysis. 2- LH, FSH, testosterone. 3- Karyotype. 4- Testicular and Trans rectal ultrasound. 5- Prolactin.

For female partner: 1- Pelvic anatomy **(**trans vaginal ultrasound**)** 2- Detection of ovulation a. Urinary luteinising hormone estimation b. Midluteal progesterone c. Ultrasound monitoring of follicular growth and confirmation of d. follicular rupture. 3- Ovarian reserve test **(**FSH, AMH anti mullerian hormone, antral follicle count**)** these measures predict the response to gonadotropin stimulation in IVF. 4- Tubal patency test a. Hysterosalpingogram b. Hyster contrast sono salpingography c. Laparoscopy and dye test 5- Laparoscopy in symptomatic women 6- Hysteroscopy in known uterine anomaly or pathology. **(**15**)**

Investigation of suspected tubal and uterine abnormalities: - There is many tests to asses tubal patency, but no test is perfect for evaluation of tubal function, those tests are:

1. Laparoscopy and dye test: Laparoscopy is widely considered to be the gold standard test for tubal patency; enables a direct visual inspection of the entire external length of the fallopian tube and the pelvis which improves its diagnostic and prognostic ability, Opportunistic of mild/minimal endometriosis and peri-adnexal adhesions confirm significant therapeutic benefit.
2. Hysterosalpingogram: Hysterosalpingogram **(**HSG**)**: A hysterosalpingogram imaging test that is used to examine the cavity of the uterus and Fallopian tubes. In a hysterosalpingogram, dye **(**called contrast material**)** is injected through a tube inserted through the vaginal into the uterus. A series of x-ray pictures are taken as the dye moves through the uterine cavity and out through the Fallopian tubes. If the Fallopian tubes are normal, the dye will flow out through the tubes into the abdominal cavity, and is then naturally absorbed by the body. The test takes about 15-30 minutes and is performed by a radiologist or gynaecologist, typically in the radiology department of the hospital, **(**HSG**)** is cheap and widely available and due to the longevity of its use, has the largest evidence base to rule out unilateral or bilateral tubal block. It has a low sensitivity of 53% and a high specificity of 87%, Limitations include failed catheterization or instrumentation and/or incomplete seal around the cervix, false positive due to tubal spasm or debris and reporting errors, The ideal time for the test is menstrual cycle day 7 to 12 **(**i.e., after the end of menstruation but before ovulation**)** Radiation exposure from this is significantly higher than that of a standard chest Xray10 and there is a 1–3% risk of pelvic infection. **(**16**)**
3. Hysterosalpingo contrast sonography: Hysterosalpingogram contrast sonography **(**HyCoSy**)** is a transvaginal ultrasound technique in which a water-soluble contrast medium is injected into the uterine cavity using a 5For 7F catheter. The test is performed in an outpatient setting with the woman in a semi-lithotomy position which allows easier access for cervical catheterization.
4. Transvaginal hydro laparoscopy, salpingoscopy, falloposcopy, fertiloscopy: Transvaginal hydrolaparoscopy **(**THL**)** involves insufflation of the pelvis with 0.4–0.6 litres of a fluid medium through an insufflating needle inserted into the posterior fornix, followed by the introduction of a small diameter rigid angled endoscope to visualize the pouch of Douglas **(**POD**)**, pelvic side-walls, adnexa and tubal patency **(**the dye injected trans cervically**)**, Salpingoscopy is the endoscopic visualization of the Endo salpinx of the tubal infundibulum and ampulla at laparoscopy and/or THL, whereas falloposcopy is the endoscopic visualization of the whole Endo salpinx at hysteroscopy, currently there is no universally agreed and

validated system to classify normal and abnormal findings and therefore, there is a lack of prognostic ability, Fertiloscopy is an outpatient technique that combines hysteroscopy, THL and salpingoscopy .

5. The role of laparoscopy in infertility: -A laparoscope is a thin fibre optic telescope that is inserted into the abdomen usually through the belly button **(**umbilicus**)**. The fibre optics allow a light to be used to see inside the abdomen. Carbon dioxide **(**CO2**)** gas is placed into the abdomen prior to inserting the laparoscope. Contemporary laparoscopy equipment consists of an imaging system comprising a telescope and a video camera system, an insufflation or abdominal wall lift system and specialized surgical instruments, most imaging systems are also equipped with printer, video recorder, or DVD recorder for documentation.

History of laparoscopy: laparoscopy was first performed by jacobaeus of Sweden in 1910 where a Nitze cystoscopy ,composed of a candle and a hollow tube was used to illuminate the peritoneal cavity, laparoscopy seems to have been developed more or less independently in the united states and various countries in Europe in 1911, Bertram bernheim ,a general surgeon at johns Hopkins reported two cases in which through a small abdominal incision , he introduced a proctoscope to examine the upper abdomen in procedure he called organoscopy ,Kalk of Germany was instrumental in developing laparoscopy into diagnostic procedure in early 1930s. Albert decker with T.H.cherry used knee to chest position to introduce a lens with a miniaturized incandescent bulb at the tip through the posterior fornix to visualize the pelvic organs **(**culdoscopy**)** was born and widely used in united states during the era of 1950 -1970 . Today Laparoscopy is a mandatory procedure for full assessment of the infertile couple.

Diagnostic laparoscopy: Laparoscopy can aid in the evaluation of patients with acute pelvic pain and abdominal pain, ovarian torsion, ovarian cyst rupture, ectopic pregnancy and pelvic inflammatory disease, in evaluation of less emergent conditions, such as chronic pelvic pain, infertility, pelvic adhesions, endometriosis, uterine fibroids and adnexal masses. Operative laparoscopy: Operator experience is considered in this type, commonly performed procedure include Adhesiolysis, treatment of endometriosis, tubal sterilization, ovarian cystectomy, oophorectomy, salpingectomy and hysterectomy. **(**17**)**

Method and Material:

This study is a retrospective study carried out at Al-Amal Hospital, on patients attending with a chief complaint of infertility and seeking pregnancy. The sample was divided into two main groups: primary infertility and secondary infertility patients. The data was collected from patient records for the in-patients at the Gynaecology Department at Al-Amal Hospital, over a period of two years between January 2018 and December 2019. Selected patients were females have infertility for more than 1 year at least, between 20 years old **(**being the youngest at the study group**)** and 47 years **(**being the eldest**)**. Investigation was done to all patients to exclude possible causes of infertility, All of patients did HSG before diagnostic laparoscopy.19 patients included in this study had IVF trail failed **(**from 1 time and up to 6 times**)** Total sample size is 129 patients.

Inclusion criteria: Primary or secondary infertility for 1year and more, Normal hormonal profile, Regular cycle, Hsg done before diagnostic laparoscopy.

Exclusion criteria: Abnormal hormonal profile, Pco patients, Uterine abnormalities, Patients with known disease cause infertility, Couples with male factor cause of infertility, Couples who are not living together for more than one year, Couples who are seeking pregnancy in less than one year.

Age of group	Frequency	Valid percent	Cumulative percent
20-30	58	45%	45.0
31-40	59	45,7%	90.7
41-50	12	9.3%	100.0
total	129	100.0	

- Table **(**1**)** show age distribution in the sample, about 45.7% of the patients were between the ages of 31 to 40 years old.

Table 1: age distribution in the sample.

Type of infertility	frequency	Valid percent
Primary infertility	51	39.5%
secondary infertility	78	60.5%
total	129	100.0%

- Table **(**2**)** show the percentage of patients in each group of the study which shows that from the total 129 patients there was 51 patients with primary infertility present of 39,5% and 78 patients with secondary infertility 60,5%.

Table 2: describe the total number of patients in each group.

Ivf trials	No of patients	Valid percent	Cumulative percent
1.0	10	52,6%	52.6
2.0	4	21,1%	73.7
3.0	4	21,1%	94.7
6.0	1	5,3%	100
Total	19	100%	

Table 3: show number of patients in the study who have done an IVF trail and failed.

Duration by years	Frequency	Valid percent	Cumulative percent
1-4	91	70.5%	70.5
5-8	31	24.0%	94.6
9-12	7	5.4%	100.0
total	129	100%	

Table 4: duration of infertility by years.

- This table show the duration of infertility divided to 3 groups according to study sample. - It shows that the majority of the sample 91 patient had infertility from 1 and up to 4 years irrespective of the type of infertility, this presents a 70.5% of the sample. - 31 patient have infertility between 5to 8 years 24% of the sample, and only 7 patients have infertility for 9 to 12 years 5.4 % from the sample.

Laparoscopic findings	Frequency	Valid percent%	Cumulative percent
Free	31	16.7%	17.6
Endometriosis	40	22,7%	40.3
Adhesions	49	27,8%	68.2
Bilateral hydrosalpinx	15	8,5%	76.7
Unilateral hydrosalpinx	13	7,4%	84.1
Unilateral block	22	12,5%	96.6
Bilateral block	6	3,4%	100.0
Total	176	100%	

- This table show all laparoscopic findings in general irrespective of the type of infertility, the most common infertility cause found was tubal disease which include **(**bilateral and unilateral hydrosalpinx, unilateral and bilateral tubal block**)** there was a 56-patient had tubal disease 31,8% of all cases, the second most common cause found was adhesions as 49 patient 27.8% of all patients, this could be caused by previous surgeries, endometriosis and pelvic inflammatory disease.

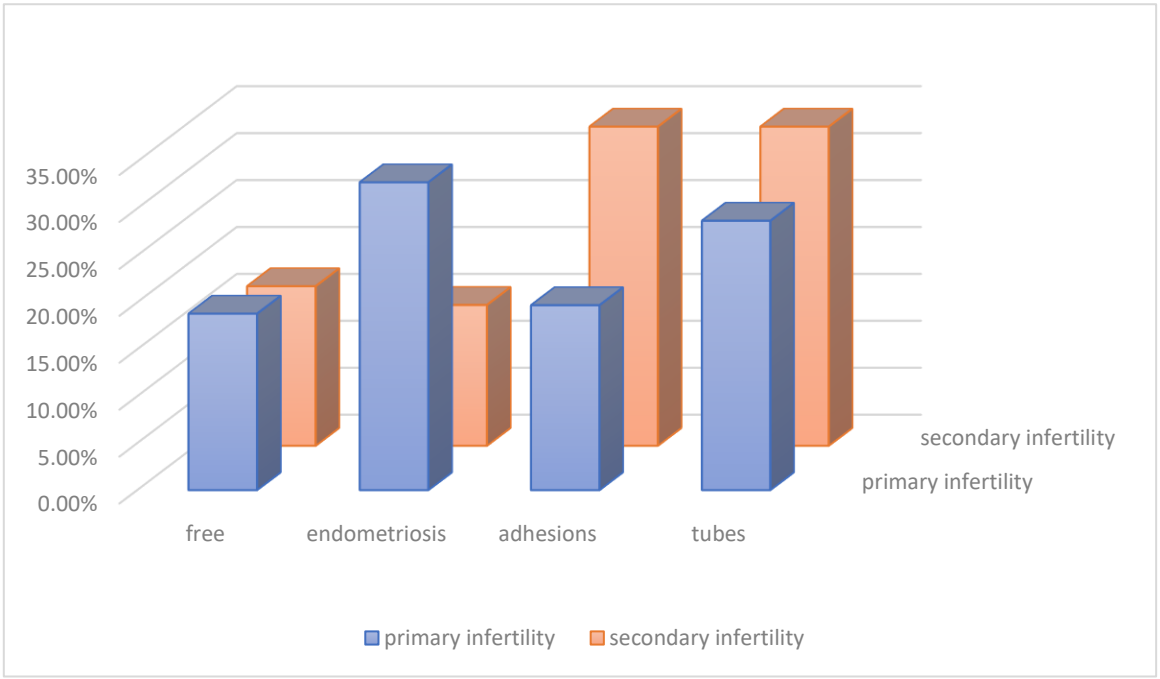
Table (5): laparoscopic findings in the total study sample **(**the total patient 129 in the study, in some of them there was more than one factor this result in total 176 findings.

Laparoscopic findings were:

1. Tubal factor 32%
2. Adhesions 28%
3. Endometriosis23%
4. Free17%

Laparoscopic findings		Types of infertility Count%		Number%
		Primary	secondary	
Free		14 (18,4%)	17 (17%)	31 (17.6%)
Endometriosis		25 (32,8%)	15(15%)	40 (22.7%)
Adhesions		15 (19,7%)	34(34%)	49 (27.8%)
Tube 56 31.8%	Bilateral hydrosalpinx	10 (13,1%)	5(5%)	15 (8.5%)
	Unilateral hydrosalpinx	3 (3.9%)	10(10%)	13 (7.4%)
	Unilateral block	6 (7.8%)	16(16%)	22 (12.5%)
	Bilateral block	3 (3.9%)	3(3%)	6 (3.4%)
Total		76 (43.2%)	100(56,8%)	176 (100%)

Table 6: laparoscopic findings in group (A) primary infertility versus laparoscopic findings in group (B) secondary infertility.



- This chart explains the different laparoscopic findings between the two study groups, primary and secondary infertility.

- Its seems that the most common findings in primary infertility was endometriosis by 32.8% which means that almost third of patients have this condition as the main cause of infertility which also responsible of other risks that impact fertility like adhesions that caused by endometriosis and result from fibrosis and inflammatory process, adhesions is less prevalence 19.7% of primary infertility patients have adhesions, the second important factor found by laparoscopy is tubal disease which contribute 28.7% of all cases in primary infertility, in 10 cases there was bilateral hydrosalpinx 13.1% of all cases of primary infertility and as hydrosalpinx means the end stage of tubal disease its best management salpingectomy then followed by IVF , however this raises an ethical dilemma as bilateral salpingectomy renders the woman entirely dependent on IVF for conception. The long-term fertility and psychological impact of such an approach is unquantified and, therefore, management of these women should be individualized based on age, presence of co-aetiologies and the local and personal resources available to fund continued IVF treatments. - Only 18.8% of patients with primary infertility have negative findings and no gross pathology was found, this raises the important role of laparoscopy in diagnosis of possible infertility causes and to exclude also unexplained infertility or prove it. - In group **(**B**)** secondary infertility patients adhesions and tubal factor have the same prevalence 34%, this rise the concern about previous surgeries specially caesarean section as the main cause of these factors impact fertility, in 16 cases 16 % the tubal factor was unilateral tubal block, and in 10% unilateral hydrosalpinx this means in secondary infertility unilateral tubal defect is the majority of cases of tubal factor, in this group endometriosis was found only in 15% of all cases this may be because the majority of endometriosis cases diagnosed earlier in symptomatic patients or as a case of primary infertility.

Laparoscopic findings	Type of infertility count %		Number%
	Primary	secondary	
Free	14 **(**45%**)**	17 **(**54.8%**)**	31 **(**17.6%**)**
Adhesions	15 **(**30.6%**)**	34 **(**69.4%**)**	49 **(**27.8%**)**

- In this study 37 patient had surgeries before **(**this include caesarean section, appendectomy and ovarian cystectomy**)**, from those 8 patients 21.6% does not have adhesions, and 29 patient 78.4% have adhesions.

Table 7: negative findings and adhesions in primary versus secondary infertility

Tube / HSG	Bilateral hydrosalpinx	Unilateral hydrosalpinx	Unilateral block	Bilateral Block	Normal	total
Normal	1 1.4%	4 5.7%	10 14.3%	3 4.3%	52 74.3%	70
Abnormal	14 23.7%	9 15.2%	12 20.3%	3 5.1%	21 35.5%	59
total	15 25.4%	13 10%	22 17%	6 4.65%	73 56.5%	129

Table 9: HSG results compared with laparoscopic tubal findings

- HSG was done to all patient within a year before laparoscopy ,from a 129 patient 70 patient have normal HSG and 59 patients have abnormal HSG , it takes into consideration laparoscopic appearance of the tube , hydrosalpinx and results of dye test .

- In patients with normal hsg group there was 52 patient have normal tubes by laparoscopy which contribute 74.3% of them but 18 patient had abnormal tubes by laparoscopy 25.7% this mean quarter of all patients with normal tubes by hsg actually have abnormal tubes ,14.3% unilateral tubal block, 5.7% unilateral hydrosalpinx ,4.3% bilateral tubal block and 1.4% with bilateral hydrosalpinx. - From 59 patients with abnormal hsg 21 patients actually have normal tubes by laparoscopy, a 35.5% more than third of patients with normal tubes and 64.5% have abnormal tubes by laparoscopy, the majority in this sample had bilateral hydrosalpinxes 23.7% and unilateral tubal block 20.3%. - From this we can prove that hsg have a low sensitivity and high specifity, for this reason we can't depend only on one test to check tubal condition and patency in cases of infertility, we take into consideration tubal appearance, hydrosalpinx and peretubal adhesions, which could be difficult to identify by hsg only.

Discussion

Infertility is failure of a couple to conceive for one year despite regular unprotected intercourse, primary infertility is when pregnancy never occurred before, secondary infertility when pregnancy occurred before and followed with interval of seeking pregnancy. In this study the mean age 31.7 ±5.94 SD, and the mean duration of infertility was 3.73a total SD for a total of 129 patients with 51 patient have primary infertility and 78 patient have secondary infertility. According to the national instate of health and care excellence **(**NICE**)** It is estimated that infertility affects 1 in 7 heterosexual couples in the UK. 14%, and the number increasing worldwide due to many risk factors and changing in modern lifestyle, increased maternal age, and improving in facilities of investigating infertility. Once a diagnosis has been established, treatment falls into 3 main types: • Medical treatment to restore fertility

(for example, the use of drugs for ovulation induction) • Surgical treatment to restore fertility (for example, laparoscopy for ablation of endometriosis) • assisted reproduction techniques (ART) – any treatment that deals with means of conception other than vaginal intercourse. It frequently involves the handling of gametes or embryos. According to WHO One in every four couples (25%) in developing countries had been found to be affected by infertility, and it's estimated that (66%) of the infertile couples had moderate to severe depression. (18)(19) An estimated 34 million women, predominantly from developing countries, have infertility which resulted from maternal sepsis and unsafe abortion (long term maternal morbidity resulting in a disability). Infertility in women was ranked the 5th highest serious global disability (among populations under the age of 60). (20)

Women who are thought to have comorbidities should be offered laparoscopy and dye so that tubal and other pelvic pathology can be assessed at the same time. In this study other causes of infertility was excluded like PCO, abnormal hormonal profile, uterine abnormalities, male infertility and known disease that impact fertility, all patient have done investigation for possible infertility causes, and tubal patency was checked by hsg before laparoscopic procedure. Tubal disease was the most common finding in all patients in the study irrespective to the type of infertility by 31.8% of cases; unilateral tubal block was the majority of these cases by 12.5 % of all. In patients with primary infertility 32.8% of cases had endometriosis by laparoscopy which contribute almost third of cases , A number of theories for endometriosis-related infertility have been proposed, including chronic inflammation, tuboperitoneal anatomic distortion and reduced endometrial receptivity, leading to compromised oocyte and embryo quality, and ovarian reserve, but the precise mechanism has yet to be determined, about 28.7% of cases of primary infertility had tubal disease compared with secondary infertility patients only 15% had endometriosis and 34% of cases have tubal disease and equally 34% of cases have adhesions which contribute the major causes in this group ,these results emphasize the important role of diagnostic laparoscopy in investigating patients with infertility and as the results is wide different between those two groups it should be kept in mind that the causes of primary and secondary infertility affected by many risk factors , previous surgeries ,previous mode of delivery ,increase in body mass index ,sedentary life style, and other comorbidities which was not included in this study . Also, a large number of patients in this study had treatment of their condition with operative laparoscopy at the same time of diagnosis it was difficult to follow up those patients to estimate successful pregnancy rate after treatment due to lack data. the comparison between laparoscopy and hsg (hysterosalpingogram) as a methods to evaluate tubal patency have many benefit and risks for both, laparoscopy is still the gold standard method to evaluate tubal condition, it's a day case procedure but should be done under general anaesthesia by an expert surgeon as many of these procedure is

diagnostic and operative at the same time for example doing adhesolysis and treating endometriosis by excision or ablation in the aim of decrease number of surgeries that the patient will going to do and to safe time ,on the other hand hsg is simple radiation imaging with contrast that show the uterine cavity and tubes which is widely used and available ,it have some limitations that can cause false positive results like spasm or derides and risk of infection 1-2%. In this study all patients have done hsg 70 patient had normal hsg and 59 patients had abnormal hsg, then we compare the laparoscopic finding which was significant 74.3% of patient with normal hsg have normal tubes by laparoscopy and the rest 25.7% found to have abnormal tubes, in comparison 64.5% of patient with abnormal tubes have actually abnormal tubes by laparoscopy, and 35.5% have completely normal tubes by laparoscopy, this result emphasize the fact that hsg have low sensitivity and high specifity, so for that reason evaluation of the tube in infertility patients should not be done only by one test specially if hsg had positive result.

Similar study was done by Dr. Samsad Jahan, Associate Professor, Department of gynaecology & Obstetrics, BIRDEM, Dhaka, Bangladesh in 2012 About the role of laparoscopy in infertility : In a retrospective study of 495 infertile women with unexplained infertility, laparoscopy before starting treatment revealed a significant incidence of abnormalities resulting in a changed treatment decision 22Among 172 patients **(**35%**)** with abnormal findings, 21 **(**4%**)** had severe abnormalities that resulted in a change of treatment to IVF or open surgery. In another 103 patients **(**21%**)**, abnormalities like endometriosis **(**stages I and II**)**, and adhesions were directly treated by laparoscopic intervention. retrospectively reviewed 265 women who had laparoscopies performed after normal hysterosalpingograms, although 129 **(**49%**)** had one or more abnormal laparoscopic findings, only 7% of cases had findings that might require standard operative laparoscopy or laparotomy, although not all were causally related to infertility. They advocated a Micro-laparoscopic approach for women where history and HSG were not suggestive of pelvic disease. **(**21**)**

Another study done by Shilpa Bhandari, Aparna Singh, Pallavi Agrawal1, Ishita Ganguli Departments of Reproductive and Fetal Medicine and 1Obstetrics and Gynaecology, Sri Aurobindo Medical College and PG Institute, Indore, Madhya Pradesh, India done in 2013 A total of 198 patients fulfilled the criteria. Out of 198 women, 109 **(**55.1%**)** had primary and 89 **(**44.9%**)** had secondary infertility. In the secondary infertility group hysteroscopic abnormalities were more common, while in the primary infertility group laparoscopic abnormalities were seen more frequently. Patients undergoing laparoscopy after previous failed IUI were more likely to have abnormalities in both laparoscopy and hysteroscopy. Endometriosis and adnexal adhesions were the most common abnormalities detected in laparoscopy in the primary and secondary infertility groups, respectively. The most common

intrauterine pathology in both the groups was peritoneal adhesions. Of the 198 patients included in the study, 103 **(**52%**)** had pathological findings at laparoscopy. Whereas only 46 patients had pathological findings by hysteroscopy. **(**22**)**

Conclusion

At the end of this study, we concluded that laparoscopy play an important role in investigating patients with infertility and treating possible causes. As it gives direct visualization of pelvic organs and possibility to treat the cause at the same time, also as tubal factor was the most common findings in both groups, laparoscopy have a greater benefit in evaluating tubal condition than hsg. The role of laparoscopic surgeries is growing in all fields especially in gynaecology which is promising women in a future with large hope and less pain.

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