

Prevalence of bacterial infection and their sensitivity in patients undergoing an infertility eval

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Abstract

Background: Infection with *sexually* transmitted diseases is broad and includes bacterial, viral and protozoa infection. Large number of infected people goes untreated because of symptomatic or unrecognized infections.

Patients and methods: Forty five patients was complaining from infertility (primary or secondary), consulting Kammal El-Sammari Hospital for infertility from May - 2008 to February - 2009. Control group consisted of twenty fertile women that consulting private clinic for checking. Four swabs were taken from each woman in two groups. Two swabs were taken from posterior fornix of the vagina (High vaginal swab) and the last two were taken from endocervical canal. First swab (vagina and cervix) was examined directly under light microscope (wet mount) and stained by Gram stain.

The other swab was cultured on Blood and Chocolate agar.

Results: The patients group consisted from forty-five female patients, their aged ranged from (22-45 years), (X= 32.9). Direct examination (wet mount) and Gram staining of high vaginal swab showed significant increased in leukocyte (pus cells) and epithelial cells in infertile group than normal one. The isolated bacteria from culture of high vaginal swab were *Streptococcus agalactiae* (group B streptococci) which was significantly increased than fertile group. This bacteria was sensitive to Cephaloxin and Cephotaxime and resistant to Penicillin

Conclusions: The isolated bacteria from culture of high vaginal swab were *Streptococcus agalactiae* (group B streptococci). This bacteria was sensitive to Cephaloxin and Cephotaxime and resistant to Penicillin .

Key wards: Infertility, bacteria, antibiotic.

Al - Kindy Col Med J 2010 ; Vol .6 . No. (1) p :

Introduction:

The evaluation of infertile patient is broad and required much analysis to reach the etiology, because there are many causes of infertility. One of it is ovarian tube dysfunction due to pelvic inflammatory disease (PID) which is the major cause of it (1). PID is a broad term used to cover upper genital tract infection, these infection usually spread from vagina or cervix through uterine cavity (2). Thus, infection with sexually transmitted diseases is broad and includes bacterial, viral and protozoa infection. Large number of infected people goes untreated because of symptomatic or unrecognized infections. If this infection is untreated,

delayed or inadequate the end sequel of this leads to infertility, entopic pregnancy and neonatal infection (3) One of the most common bacteria is genital *Chlamydia trachomatis* infection has long been recognized as the major cause of pelvic disease and subsequently infertility (4, 5). So using *Chlamydia trachomatis* specific heat shock protein -60 antibodies as a prognostic marker for infertility (6). Other bacteria is *Neisseria gonorrhoea* that had also been reported to cause ascending genital infection in women leads to predominant complication (acute salpingitis) which is the most common cause of female infertility in the world (7). In humans, both *Mycoplasma* and *Ureaplasma* species may be transmitted by

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direct contact between hosts, both organisms had been associated with increased risk of PID and infertility through fertilization or implantation (8, 9). Approximately one quarter of women presenting to an infertility clinic seeking to conceive were found to have a positive results for detection Ureaplasma urealyticum, Mycoplasma hominis, Chlamydia trachomatis and Neisseria gonorrhoea from cervical swab and 10% of

them were rubella positive (non immunized previously) (10). Hence, sexually transmitted diseases are an important public health concern with major burden on female reproductive tract (11). For this reason, we sought in this

study to determine the prevalence of vaginal and cervical bacterial infection and their sensitivity to antibiotics in a group of women undergoing work-up for infertility treatment and conceiving.

methods:

Patients group: Forty five patients was complaining from infertility (primary or secondary), consulting Kammal El-Sammari Hospital for infertility from May - 2008 to February - 2009.

Control group: Twenty fertile women that consulting private clinic for checking. Four swabs were taken from each woman in two groups. Two swabs were taken from posterior fornix of the vagina (High vaginal swab) and the last two were taken

from endocervical canal. First swab (vagina and cervix) was examined directly under light microscope (wet mount) and stained by Gram stain. The other swab was cultured on Blood and Chocolate agar. The antibiotic sensitivity test (vagina and cervix) was done for isolated pathogenic bacteria.

Statistical analysis: Analysis of the data was done using student t-test.

Results:

The patients group consisted from forty-five female patients, their aged ranged from (22-45 years), (X= 32.9). They were complaining from infertility, 55.5% were complaining from primary infertility, their aged ranged from (22-40 years) (X=31.6) and the rest (44.4%) were complaining from secondary infertility, their aged ranged from (24-45 years) (X=32.8). The control group consisted of twenty normal fertile women who came for checking, their aged ranged from (20-39 years) (X=28.5).

Direct examination (wet mount) and Gram staining of high vaginal swab showed significant increased in leukocyte

(pus cells) and epithelial cells in infertile group than normal one (Table-1-). Direct examination (wet mount) and Gram staining of cervical swab demonstrated significant increased in polymorphonuclear leukocytes and epithelial cells in infertile patients than normal one (table-2-). The isolated bacteria from culture of high vaginal swab were *Streptococcus agalactiae* (group B streptococci) which was significantly increased than fertile group (table-3-). This bacteria was sensitive to Cephaloxin and Cephotaxime and resistant to Penicillin (table- 4-). The was no growth of Neisseria gonorrhoeae could be detect.

Table-1- Illustrated finding in high vaginal swab From infertile women and control group.

Findings in wet mount and Gram stain	Infertile women No.=45		Control women No.=20	
	No.	%	No.	%
Trichomonas vaginalis	0	0	0	0
Budding yeast	11	24.4	1	5
Pseudomycelia	3	6.6	0	0
Clue cells	0	0	0	0
Leukocytes <5 cells/high power field	31	68.8	20	100
Leukocytes >10 cells/ high power field	14	31.1	0	0
Epithelia cells < 5 cells /high power Field	21	48.6	20	100
Epithelia cells > 5 cells / high power field	24	53.3	0	0
Gram positive bacilli	45	100	20	100
Gram positive cocci	10	22.2	2	10

(1): P> 0.001 N.S.=Not significant

Table-2- Illustrated the finding in endocervical swab From infertile women and control group by Gram stain.

Findings in wet mount and Gram stain	Infertile women No.=45		Control women No.=20	
	No.	%	No.	%
Gram negative intracellular diplococci	0	0	0	0
Polymorphonuclear leukocytes > 10	10	22.2	0	0
Epithelial cells < 5	35	77.7	20	100
Epithelial cells >5	10	22.2	0	0

(1): $P > 0.001$ N.S.=Not significant**Table-3- Results of bacteria isolated from high vaginal swab From infertile women and control group.**

Type of bacteria	Infertile women No.=45		Control women No.=20	
	No.	%	No.	%
Group B streptococci (<i>Streptococci agalactiae</i>)	11	24.4	1	5
<i>Lactobacillus</i> species	45	100	20	100
<i>Diphtheroid</i>	45	100	20	100
Non hemolytic <i>Streptococci</i>	45	100	20	100
Alpha hemolytic <i>Streptococci</i>	45	100	20	100
<i>Candida albicans</i>	10	22.2	2	10

N.S.=Not significant

Table-4- Antibiotic sensitivity test to *Streptococci agalactiae*

Type of antibiotic to <i>Streptococci agalactiae</i>	Sensitive		Resistance	
	No.	%	No.	%
penicillin	4	36.3	7	63.6
Ampicillin	7	63.6	4	36.3
Amoxicillin	7	63.6	4	36.3
Cefalexin	11	100	0	0
Cephalothin	9	81.8	2	18.1
Cefotaxime	10	90.9	1	9.01

Discussion

The presence of any bacteria in the upper female reproductive tract can affect fertilization, implantation and capacity to keep embryo. Thus, ascending infection with *Neisseria gonorrhoeae*, *Chlamydia trachomatis* bacteria can cause pelvic inflammatory diseases (PID) with infertility or ectopic pregnancy as late sequelae (12). So this study tried to demonstrate any bacteria

obstacles conception. First, direct vaginal exam (wet mount and Gram stain) showed

significant increased in number of leukocytes (31.1%) and epithelial cells (53.3%) in infertile group. This high number of pus cells may be due to Trichomoniasis infection or cervicitis (12). *Trichomonas vaginalis* did not report in this study. In addition to that, absence of clue cells to detect Gardnerella and presence of high number of *Lactobacilli*

(100%) in same infertile group. According to Nugent *etal* 1991 (13) grading system in both groups (fertile and infertile) the scoring vaginal Gram stain for bacterial vaginosis (BV) was (0-3) and the interpretation of this was normal and absence of BV in both groups. This BV was caused by Gardnerella and anaerobic bacteria (14). So one can concluded that infection with these bacteria was absent and exclude BV as a cause of infertility because BV increased risk of PID (15). Mycotic infection by *Candida albicans* was another cause of vaginitis and found in asymptomatic women (10-30%) (12) Which was in agreement with our results (24.4%). In case of cervical swabs examination (wet mount and Gram stain) showed significant increased in polymorphonuclear cells and epithelial cells than control group. This may be due to cervicitis which is caused by either *Neisseria gonorrhoeae*, *Chlamydia trachomatis* infection (16). Gram stain was not helpful for the diagnosis of gonococcal infection in female patient, unlike in males. Hence, Culture was essential for the diagnosis of gonococcal infection in females (17). In this study, Cultures of cervical swabs had been done, but *N gonorrhoeae* could not be isolated. So this high level of polymorphonuclear cells might be due to Chlamydial infection which was difficult to isolate because it was need tissue culture due to its intracellular location (18). Other report had been found 47.3% of infertile population

was positive for at least one microorganism (12.9% for *Chlamydia*, 0.3% for gonococcal, 23.5% for *Ureaplasma* and 4.8% for *Mycoplasma*) (19). Therefore screening for Chlamydia was effective to prevent pelvic inflammatory diseases (20). Other bacteria that were isolated in this study were group B Streptococci (*Streptococcus agalactia*) which was not significantly different from control group. This bacteria was not the cause of infertility but it had been found that was a major cause of neonatal mortality and morbidity (21). Therefore antenatal screening for these bacteria was advisable (22). Additional to that normal flora was also isolated which was in agreement with other reports (23). The presence of these normal flora will exclude other conditions like BV which was a poly microbial syndrome characterized by a shift in vaginal flora from predominant population of Lactobacilli to their gradual or total replacement with anaerobes such as (*Gardnerella vaginalis*, *Prevotella*, *Bacterioides*, *Mobiluncus* species, *Mycoplasma* and *Ureaplasma* species) (24). Antibiotic sensitivity test was done for group B Streptococci. It had been found that it was sensitive to Cephalosporins (Cefalexin, Cephalothin and Cefotaxime) and resistance to penicillin group because of miss use of antibiotics and short duration of treatment that leads to increased resistance of bacteria to antibiotics (25).

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