Bacterial Infection and Seminal Fluid Parameters in Iraqi Sub Fertile Men

Mamdooh A. Al_ Nasrawi[1], Loqman J. Tawfiq[2]

[1]Assist Prof., [2] Lac. Prof., Ministry of Higher Education & Scientific Research, Meddle University of Technology, Medical Technical Institute/Baghdad, Nursing Dept

Abstract

Semen samples of 60 sub fertile men that aged from 25 and 45 years that attending an Al-Sammrai infertility hospital from10-10-2017 to 5-12-2018 and were examined for bacteriological culture. The patients divide to negative group (A) the second as positive group (B). Semen were chaked from the groups and analyzed for viscosity, sperm morphology, semen volume, sperm concentration, and motility percent. The results for cultures was negative in 15% and positive in 85% of patients. The isolated organisms were as the following percentage (Escherichia coli 11%, Staph. aureus (16%), B-hemolytic streptococcus 30%, Staphylococcus epidermidis 43 %). The semen characteristics in infected samples showed that the motility and viability of spermatozoa were lower when compared to noninfected semen sample. That are means, the infections have a direct effect on seminal fluid quality and subsequently negative effects on human fertility. The results showed that there are a highly significant difference ($p<0.001$) between fertility power in noninfected men and infected cases.

***Keywords**: spermatozoon, seminal fluid, microorganisms, infection, human infertility.*

Introduction

Infections of semen may affect male fertility power in different and methods. The mechanism of infertility is not understood completely and for some researchers the possible effect of infection in human sub fertility is debatable [24], [25] . Chronic bacterial infection of semen is uncommon, but may be a cause of male infertility [5,23]

The bacterial pathologies of the genital tract are the same to those infected the urinary tract [22,28]. More studies found the correlation between seminal fluid infection and sperm quality. Fertile men have less microorganism in their seminal fluid when compared to sub fertile patients [14,22]. These bacterial infections may effects directly on the sperm, or indirectly on the seminal fuid which may include antisperm antibodies forming [7,26]. In the developing countries, the infections of semen is the most important factors that may cause human sub fertility [27]. Gdoura R. et al, (2007) [6] and Hannachi H. et al, (2015) demonstrated that genital mycoplasmas and ureaplasmas seem to be widespread among the male partners of infertile couples in Tunisia which could influence semen quality negatively . The results also found that assay of PCR-microtiter plate hybridization method takes a rapid and good effective technique to determine human genital mycoplasmas and ureaplasmas which is very useful for epidemiological and etiological studies of these pathogens.

Materials and Method

Seminal fluid samples were evaluated from 60 men (25 to 45 years of age (average of 35 f 5.9) that they were no symptoms of genitourinary system. All selected men expatriate any medication in the past 3 months. The elect sub fertile men were refused if they had a varicocele and groin injury in genital tract. At the time of insertion, the sub fertile men were tested for urethral discharge and if it was present it will be excluded. Before they visited the hospital, the men will abstain for 3-4 days. Penis and hands were washed with bactericidal effect substance (exa. Soap), then by masturbation semen samples were obtained, then it will put into a sterile specimen container. During collection of the specimen, the sub fertile patients were not to use any lubricants.

One milliliter of the seminal fluid will used for culture and sensivity examination for microorganisms growth within short time. After liquefaction of seminal fluid, we examined it for other semen parameters (concentration of sperms, percentage of motile sperms, morphology and others). Morphology was performed as Eliasson procedure in 1971. Depending on [WHO 2010] criteria, seminal fluid analysis were performed. Bacterial culture of seminal fluid was performed as described by [12]. The data was statistical evaluated by using (Student t test) with the Minitab computer program.

Results

Seminal fluid Characteristic

The sub fertile patients were 25 years to 45 years old with (average of 35 f 5.9). The sub fertility infertility duration was 2-6 years. This study inclusive 60 patients, 20 men were normal sperm concentration (35.6 %), azoospermia were 8 (12.12 %), and oligozoospermic were 12 (20 %), in 15 (25 %) were primary infertility and 5 (8.3 %) was secondary infertility. Depending on the result of bacteriological analysis, the samples were divided in two groups . The samples that did were Group A which were not show positive culture (n = 15 (25 %) and group B (n = 45) (75%) that with bacteriological positive cases. Table (1) is a summary of seminal fluid characteristics. Regarding motility percent, volume and viability,there were statistically significant differences between the two groups A and B. In group A, The motility of sperm and viability were higher in comparison to group B .

Semen Bacteriology:

Table 2 identified bacterial infection (anaerobic and aerobic) that present in the seminal fluid of sub fertile patients. The 60 samples were divided as following categories: 35 were aerobic positive bacteria and 10 were for anaerobic positive bacteria. 43% Staph. epidermidis, 11 %, E. coli, 16 %, Staph. Aureus and P-hemolytic streptococcus in 30 %.

Table 1: Relation Between Seminal fluid Cultures and semen Characteristics

Parameters	Culture was Negative	Culture was positive	P
patients numbers	15	45	
Seminal fluid volume (millimeters)	2.6± 1.5	2.7±1.0	.063
Sperm count	88±12.8	95±15.7	NS
Motility(%)	45±12	39±13	.0001
Viability(%)	72±13	64±14	.0001
Normal morphology(%)	42±13	32±11	0,001

Table 2: Anaerobic and aerobic microorganisms Isolated from 60 sub fertile patients.

Microorganisms	patients No.	percentages
Staph. epidermidis	24	43 %
E. coli	7	11 %
Staph. aureus	10	16 %
P-hemolytic Streptococcus	18	30 %

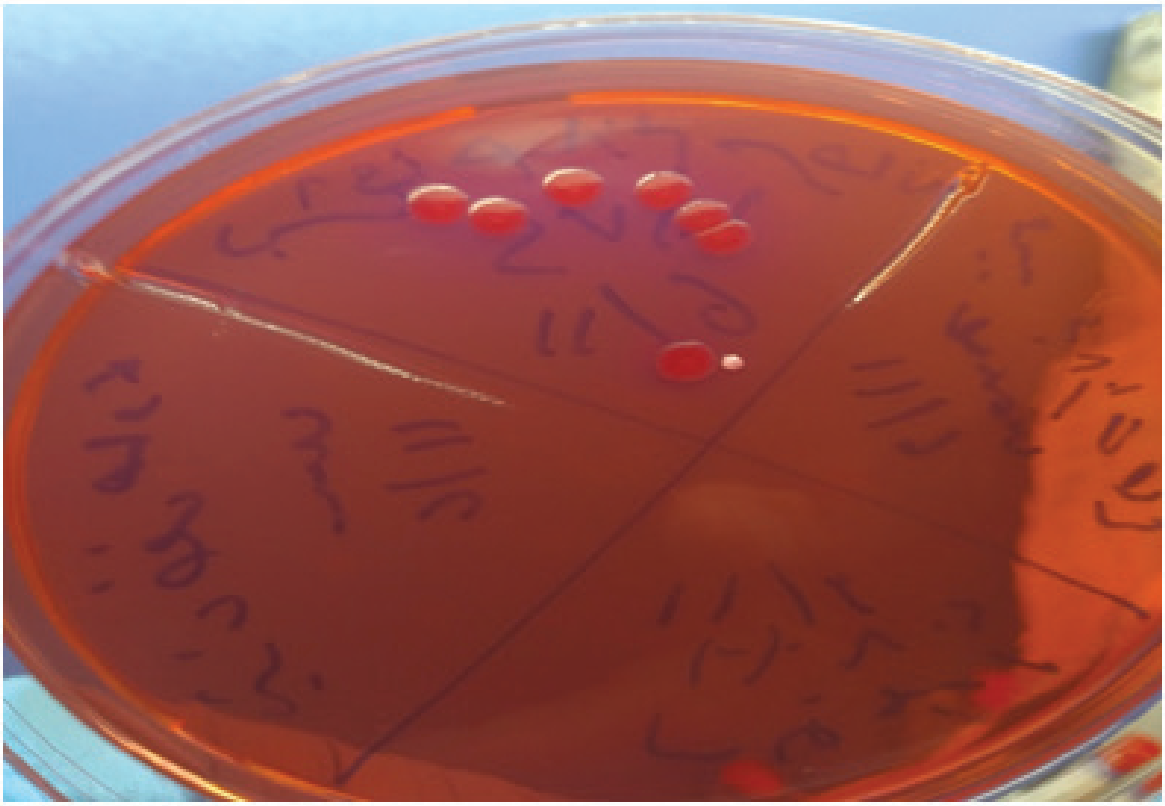

Fig 1: E coli growth

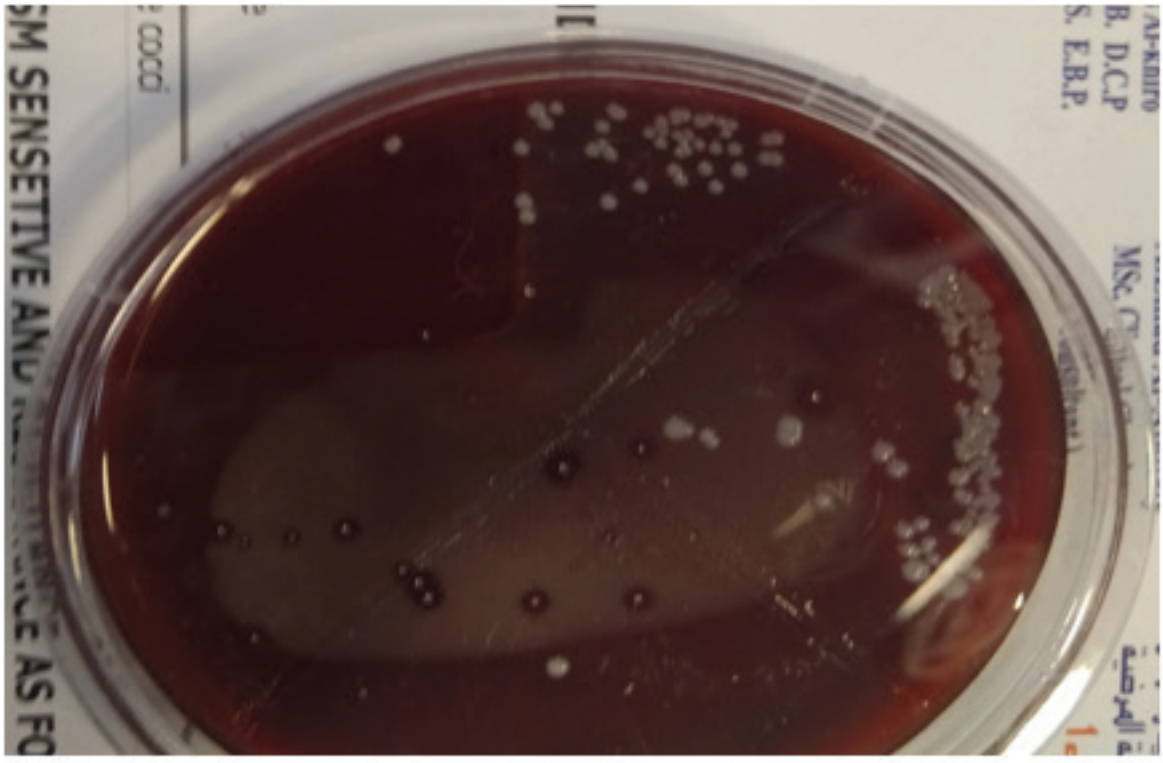

Fig 2: Gram negative cocci growth

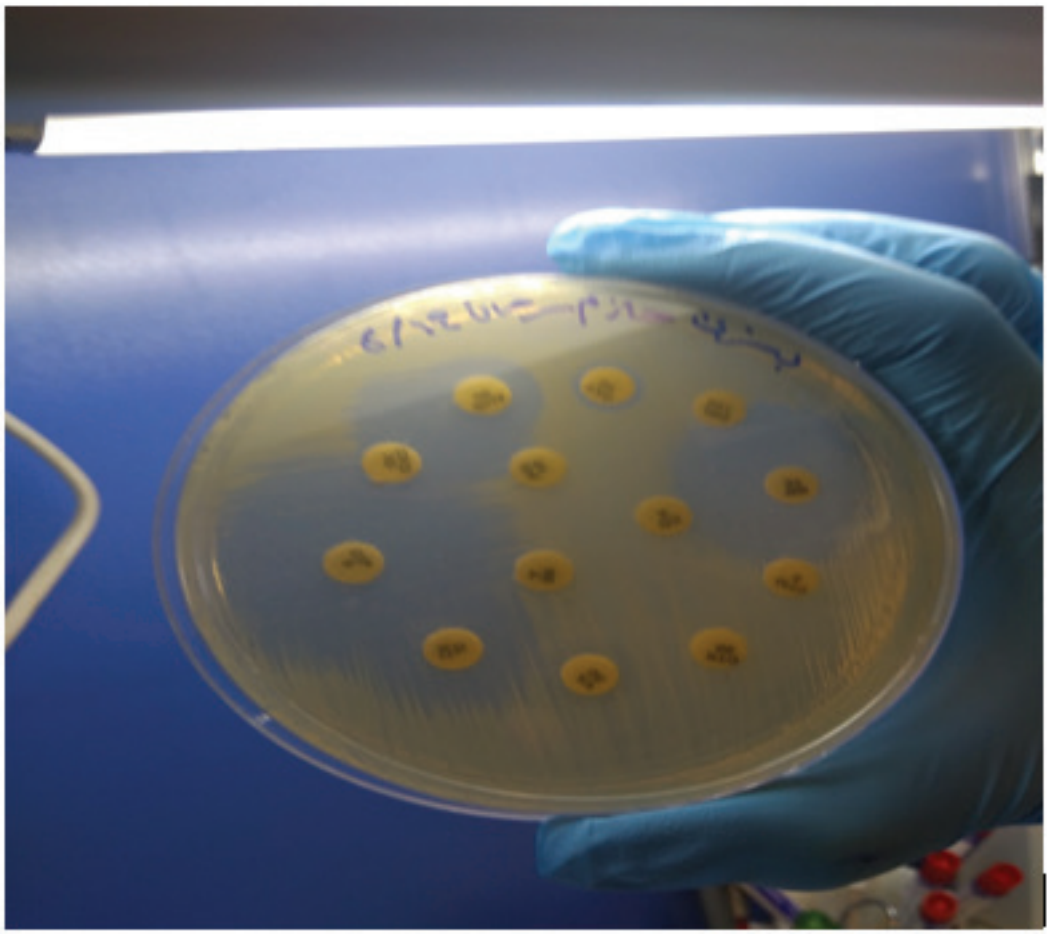

Fig 3: sensivity of bacterial culture to some type of antibiotic

Discussion

Our study is fastened on the subclinical non symptomatic infection and its relationship to sub fertility. Male accessory genital inflammation diagnosis is not easy and its causes on sub fertility is questionable. The variability in more researches is very great that the effects of microorganisms infection and seminal fluid parameters of sub fertile and fertile patients. The variation is 10 and 60 % of positive cultures of fertile men and varied between 20 and 100 % in sub fertile men (2, 3, 8, 11, 13, 15, 19, 20, 22, 27). We try to determine the effects of infection by microorganism on the semen parameters. Staphyococcus has been reported to have a prevalence in semen of 24-100% [7] found that Staph epidermidis. have prevalence of 24 – 100 % , but in our study is 63%.Besides in 28 % of cases was recovered Strept. viridans of semen specimens in comparisons to 15 – 74 % in another researches [19]. . From7 % of the samples, non aerobic gram-positive cocci were recovered in comparisons to 15 – 20 % in those of another studies [19]. Depending on our study, we find that the infection by microorganisms, make changes of seminal fluid parameters such as sperm motility percent, semen volume, and status of viability. The fail of in spermatozoon motility percent may due to fixation of mobility ability of human sperm [6], or make spermatozoon to be dead by making harmful poisons produced by the infected microorganisms [10]. Degeneration of the morphology of human spermatozoon may happen due to infection by infectious microorganisms [1], also our present study find the same effect of infection on human spermatozoon by making deep structural effect in the morphology. Other study describe that there is no difference in parameters of seminal fluid for presence of infection or not in cases of study [27]. Kenny (2018) [13] established that there were no effects of any types of microbe that present in human

seminal fluid on characteristics of sperm. In 1980, Jacques et al., established that the motility percent was decreased. The reason of variability of results may be due to seminal fluid collection ways and deference of investigation.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Ministry of higher Education & Scientific Research and all experiments were carried out in accordance with approved guidelines.

References

1. Aurox M. Infection urogenitale et fertilite masculine. J Gynecol Obstet Biol Reprod. 1988; 172369-875.
2. Busolo F, Zanchetta R, Lazone E, Cusinato R. Microbial flora in semen of asymptomatic infertile men. 1984.
3. Custo G M, Lauro V, Saitto C, Frongillo R F. Chlamydia1 infection and male infertility: an epidemio- 1989.
4. Eliasson R. Standards for investigation of human semen. Andrologia. 1971; 3:49-53.
5. Fowler J E. Infections of the male reproductive tract and infertility: a selected review. J Androl. 1981; 2:121.
6. Gdoura R 1, Kchaou W, Chaari C, Znazen A, Keskes L, Rebai T, Hammami A. Ureaplasma urealyticum, Ureaplasma parvum, Mycoplasma hominis and Mycoplasma genitalium infections and semen quality of infertile men.BMC Infect Dis. 2007;8:7:129.
7. Gimenes F1. Medina F S1. Abreu A L1. Irie M M1. Esquiçati I B1. Malagutti N1. Vasconcellos V R1. Discacciati M G2. Bonini MG3. Maria-Engler SS2. Consolaro ME1. Sensitive simultaneous detection of seven sexually transmitted agents in semen by multiplex-PCR and of HPV by single PCR. 2014.
8. Gimenes F1. Souza R P1. Bento J C2. Teixeira J J3. Maria-Engler S S4. Bonini M G5. Consolaro M E1. Male infertility: a public health issue caused by sexually transmitted pathogens .Nat RevUrol. 2014;11(12):672-87.
9. Gopalkrishnan K, Hinduja I N, Phutane L, Metha A P. Role of microbial study in selection of subjects . 1988.
10. Hannachi H1. Elloumi H2. Hamdoun M3. Kacem K4. Zhioua A5. Bahri O6. Bacteriospermia: Effects on semen parameters .Gynecol Obstet Fertil Senol. 2018;46(6):518-523.
11. Hillier S L, Rabe L K, Muller C H, Zarutskie P, Kusan F B, Stenchever M A. Relationship of bacteriologic. 1990.
12. Jacques L, Mathieu D, Auer L, Auroux M. Effect of urogenital infections on sperm parameters and Andrologia 16:269-275. logical study. Arch Androl 23:243-248. for in vitro fertilization and embryo transfer (IVF-ET). Ind J Med Res 88:141-145. characteristics to semen indices in men attending an infertility clinic. Obstet Gynecol 75:80&804. hipofertility in man. Biomed Pharmacother. 1980; 4435-228.
13. Kenny L, and Kell D. Immunological Tolerance, Pregnancy, and Preeclampsia: The Roles of Semen Microbes and the Father.Front Med (Lausanne). 2018;2018 Jan 4:4:239.
14. McGowan M P, Burger H G, Baker HWG, de Dretser D M, Kovacs G. The incidence of non-specific. 1981.
15. Megory E, Zuckerman H. Shoham (Schwartz) Z. Lunenfeld B. Infections and male fertility. Obstet . 1987.
16. Melania R. Sara C. Marina C. Paola M. Gennarina L. Salvatore D. Stefania Z. Bacterial agents as a cause of infertility in humans. New Microbiologica. 2016; 39: 3: 206-209.
17. Nahoum C R D. Inflammation and infection. In Treatment of Male Infertility, Bain J, Schill WB, SchwartLtein L (eds). Berlin: Springer. 1982;5-32.
18. Paulsson J D, Polakoski K L. Isolation of spermatozoal immobilization factor from Escherichia coli filtrates. Fertil Steril. 1977; 28: 182-1 85.
19. Pergialiotis V1, Karampetsou N1, Perrea D N1, Konstantopoulos P1, Daskalakis G2. The Impact of Bacteriospermia on Semen Parameters: A Meta-Analysis.J Family Reprod Health. 2018;12(2):73-83.
20. Purvis K. and Christiansen E. Infection in the male reproductive tract. Impact, diagnosis and

treatment in relation to male infertility.Int J Androl. 1993;16(1):1-13.

21. Rehewy M S E, Hafex E S E, Thomas A, Brown W J, Aerobic and anaerobic bacterial flora in semen from fertile and infertile groups of men. Arch Androl. 1979; 2:263-268.
22. Ricci S1-2, De Giorgi S1, Lazzeri E1, Luddi A3, Rossi S3, Piomboni P3-4, De Leo V3-4. Pozzi G1-2. Impact of asymptomatic genital tract infections on in vitro Fertilization (IVF) outcome.13(11):e0207684. doi: 10.1371/journal. pone.0207684. 2018.
23. Ruggeri M1. Cannas S1. Cubeddu M1. Molicotti P1. Piras G L2. Dessole S2. Zanetti S1. Bacterial agents as a cause of infertility in humans. New Microbiol. 2016; 39(3):206-209.
24. Sherins R J, Howards S S. Male infertility. In Campbell's Urology, Walsh PC, Gittes RF, Perlmutter AD, Stamey TA (eds). London: Saunders. 1986;672-673.
25. Sleha R1, Boštíková V, Salavec M, Mosio P, Kusáková E, Kukla R, Mazurová J, Spliňo M. Bacterial infection as a cause of infertility in humans. Epidemiol Mikrobiol Imunol. 2015;62(1):26-32.
26. Solomon M, and Henkel R. Semen culture and the assessment of genitourinary tract infections. Indian J Urol. 2017;201733(3):188-193.
27. Tao X1, Ge SQ2, Chen L1, Cai LS1, Hwang MF3. Wang CL3. Relationships between female infertility and female genital infections and pelvic inflammatory disease: a population-based nested controlled study. Clinics (Sao Paulo). 9;73: Huang C1, Zhu HL1, Xu KR1, Wang SY1, Fan LQ1,2, Zhu WB1,2(2015): Mycoplasma and ureaplasma infection and male infertility: a systematic review and meta-analysis.Andrology. 2015 Sep;3(5):809-16.
28. Thonneau P, Marchand S, Tallec A, Ferial M L, Ducot B, Lansac J, Lopes P, Tabaste J M, Spira A. Incidence and main causes of infertility in a resident population (1,850,000) of three French regions (1988- 89). Hum Reprod. 1991;6:811-816.
29. Toth A, Lesser M L. Asymptomatic bacteriospermia in fertile and infertile men. Fertil Steril. 1981; 36:88-91.
30. World Health Organization WHO. Laboratory Manual for the World Health Organization. 17 Examination and Processing of Human Semen, 5th ed. Geneva: World Health Organization. 2010.