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Research Article

**RELATIONSHIP BETWEEN ABNORMAL SEMEN
CHARACTERISTICS AND BACTERIOSPERMIA**¹Dr Haneen Zahid, ²Dr Faiza Batool, ³Aiman Ikram¹Sir Ganga Ram Hospital Lahore²THQ Hospital Shahkot³Fatima Jinnah Medical College, Lahore**Abstract:**

Aim: To determine the prevalence of bacterial infection in infertile male sperm and the relationship between positive bacterial culture and male infertility.

Study Design: A descriptive cross-sectional study.

Place and Duration: In the Fertility Clinic of Hameed Latif Hospital, Lahore for one year duration from January 2018 to December 2018.

Method: The study was conducted at a reference infertility clinic of Hameed Latif Hospital Lahore. Sperm samples were analyzed according to the principles of world health organization, and bacteriological analyzes of sperm samples were carried out using standard techniques.

Results: The average age was 37.3 ± 1.0 years. Significant bacterial spermatozoa were detected in 63 (52.5%) infertile male subjects. The most common bacterial isolates are *Staphylococcus aureus* 28 (44.4%) followed by coagulase negative *Staphylococcus* 13 (21%), *Enterococcus faecalis* 12 (19%), *Escherichia coli* 7 (11.1%), the lowest *Proteus mirabilis* 3 (4.8%). There was a significant relationship between leukocytospermia and a positive bacterial culture ($p < 0.001$). *Staphylococcus aureus* infection was higher in infertile men with oligozoospermia ($p = 0.01$). *Enterococcus faecalis* was generally isolated from infertile teratozoospermic men ($p < 0.001$). *Escherichia coli* was isolated more than men with asthenozoospermia, but this did not differ significantly from other forms of seminal infertility.

Conclusion: The incidence of bacteriospermia was high in infertile men; *Staphylococcus aureus* and *Enterococcus faecalis* infection appear to correlate with poor sperm count and abnormal sperm morphology.

Keywords: Bacteriospermia, Leukocytospermia, Infertility, Oligozoospermia, Semen

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INTRODUCTION:

Bacterial semen infection (bacteriospermia) is now known to be the main factor (15-20%) of male infertility worldwide. Evidence from research on the potential role of microorganisms in reducing sperm quality; Decreased sperm count, low sperm motility and abnormal sperm morphology. A microorganism that infects sperm usually comes from the urinary tract or is obtained during sexual intercourse with partners. *Escherichia coli* has been widely accused in the Western world as the most common etiological factor in semen infection among infertile men. Studies have also shown a significant difference in microorganisms isolated from infertile oligozoospermic, teratozoospermic and asterozoospermic males. Considering the presence of bacteria in semen and the known harmful role played by forms of male infertility and reports of changes in bacterial isolates, this study aimed to determine the prevalence of bacterial infection in semen and their distribution in Pakistan. Among the infertile men in Lahore are different types of interstitial infertility in men.

MATERIALS AND METHODS:

This descriptive cross-sectional study was taken place in the Fertility Clinic of Hameed Latif Hospital, Lahore for one year duration from January 2018 to December 2018. This is an IVF center, an important reference clinic for treatment. The study included one hundred twenty (120) men who visited our center because of infertility. Prior to enrollment in the study, oral or written consent of participants was obtained. Before starting the study, ethical consent was obtained from the ethics committee. Patients withdrew for 3-5 days and then collected semen samples by masturbation in sterile universal containers. Subjects were taught an important sperm collection process that prevents sample contamination.

Semen analysis: Semen samples were analyzed in accordance with the principles of the World Health Organization. Briefly, semen samples were diluted with 1/20 10% formalin and read microscopically using a Neubauer counting chamber developed to determine sperm count and microscopically read sperm morphology to determine Negrosin-stained semen samples. The presence of leukocytes was observed; significant leukocytospermia was defined as 106 positive leukocytes for peroxidase ejaculation / ml.

Sterility of sperm; Oligozoospermia (sperm count $<15 \times 10^6$ / ml, teratozoospermia (normal form 4%),

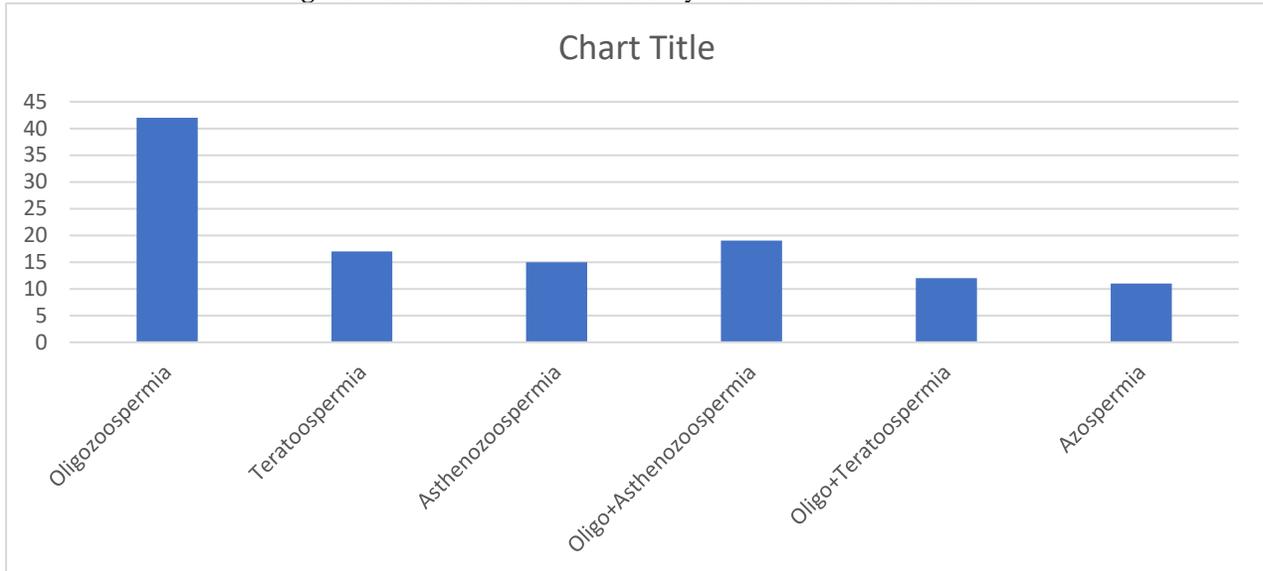
asthenozoospermia (progressive motility $<32\%$ (a + b) and azoospermia (without sperm in ejaculation) grouped Global health rules for reference values for sperm characteristics human 9 WHO reference values of 5 percent for semen characteristics, normozoospermia up to semen volume of 1.5 ml, ejaculation and 39 and 15 million sperm per ml, 58% viability, 32% progressive motility and 4% morphologically normal forms (strict criteria).

Sperm bacteriology: Bacteriological analysis of sperm samples was performed using standard techniques. Sperm samples were cultured aseptically in blood, Mackonkey agar and chocolate agar at 37 ° C for 24 hours. The resulting colonies were read and characterized using a standard biochemical test. Statistical analysis was performed using SPSS 16. P values less than 0.5 were considered significant.

RESULT:

According to microscopically observed semen characteristics, various forms of male seminal infertility were divided into six groups (a) Oligozoospermia (n = 50) 42% (b) Teratozoospermia (n = 17) 14.2% (d) (c) Asthenozoospermia (n = 15) 12.5% (d) Oligozoospermia + Asthenozoospermia (n = 20) 16.7% (e) Oligozoospermia + Teratozoospermia (n = 10) 8.3% (f) Azospermia (n = 10) = 8) 6.7% Figure 1. Oligozoospermia was the most common seminal infertility in men with the lowest Azospermia. The average age of the infertile men studied was 37.3 ± 1.0 . Of 120 respondents, 63 (52.5%) infertile men had a positive bacterial culture. The most common bacterial isolate was *Staphylococcus aureus* 28 (44.4%), while the lowest *Proteus mirabilis* was 3 (4.8%) (Table 1). There was a significant relationship between leukospermia and a positive bacterial culture ($p < 0.001$).

The distribution of bacterial isolates obtained from the semen of individuals according to the form of seminal infertility is given in Table 2. *Staphylococcus aureus* infects all infertile male forms, but is more common in oligozoospermia 16 (57%), teratozoospermia and azospermic men with the lowest *S. aureus* infection 1 (3.6% each). *Enterococcus faecalis* has been significantly isolated from infertile teratozoosperms from other people ($p < 0.001$). *Enterococcus faecalis*, infertile teratozoospermic male 9 (75%) and second oligospermic-terato-zoospermic male 3 (25%) were recovered shown in Table 2.

Fig. 1: Prevalence of seminal infertility in the infertile men tested**Table 1:** Prevalence of bacterial organisms in semen of infertile men studied

Bacterial isolates	Number	%	Mean Sperm count
Coagulase negative Staphylococcus	13	21	$10.5 \times 10^6/1 \pm 0.7$
Staphylococcus aureus	28	44.4	$9.6 \times 10^6/1 \pm 1.0$
Escherichia coli	7	11.1	$21 \times 10^6/1 \pm 0.9$
Enterococcus faecalis	12	19	$23 \times 10^6/1 \pm 1.3$
Proteus mirabilis	3	4.8	$11 \times 10^6/1 \pm 0.8$

Table 2: Prevalence of Bacterial infection in forms of male seminal infertility

Form of seminal infertility	Staphylococcus aureus (n=28)	Enterococcus faecalis (n=12)	Coagulase -ve Staphylococcus (n=13)	Escherichia coli (n=7)	Proteus mirabilis (n=3)
Oligozoospermia	16 (57.1)	-	5 (38.5)	1 (14.3)	1 (33.3)
Asthenozoospermia	3 (10.7)	-	1 (7.7)	4 (57.1)	-
Oligozoospermia+ Asthenozoospermia	5 (17.9)	-	1 (7.7)	2 (29.0)	1 (33.3)
Teratozoospermia	1 (3.6)	9 (75.0)	2 (15.3)	-	-
Oligozoospermia+ Teratozoospermia	2 (7.1)	3 (25.0)	1 (7.7)	-	1 (33.3)
Azospermia	1 (3.6)	-	3 (23.1)	-	-

DISCUSSION:

This study reports the occurrence of bacteriospermia among infertile men in Lahore. 63 (52.5%) infertile men had a significant bacterial culture. In this study,

this high incidence of bacteriospermia in infertile men overlaps with the results of previous studies. This study is an important factor for male seminal infertility blaming bacteriospermia. *Staphylococcus aureus*

(44.4%) was the most common bacterial isolate and *Proteus mirabilis* (4.8%). *Staphylococcus aureus* is the most common sperm bacterium among infertile men in sub-Saharan Africa; this differs completely from other sections that have framed *E. coli* and other gram-positive uropathogenic bacteria from around the world as the most common bacterial bacteriospermia agents. In this study, *Enterococcus faecalis* was significantly higher in infertile men with teratozoospermia and oligozoospermia + teratozoospermia. This finding is consistent with reports from two previous studies. Mehta et al. They showed that *E. faecalis* is a potential cause of combined teratozoospermia and oligozoospermia between infertile males when comparing mean sperm concentration, morphologically average sperm concentration, and sperm concentration balanced by *Enterococcus faecalis*, micrococci or alpha-hemolytic streptococci. Healthy not infected. In addition, Moretti et al. Transmission electron microscopy was used to study the ultrastructural effect of *E. faecalis* on sperm; they concluded that *E. faecalis* compromised sperm quality in terms of sperm concentration and morphology, with little or no effector effect on sperm motility. In this study, *Staphylococcus aureus* was most often isolated from the sperm of infertile men with oligozoospermia and asthenozoospermia. It is known that *S. aureus* can weaken sperm properties, especially sperm count, viability and motility. Liu et al determined the influence of some uropathogenic organisms on the parameters of human sperm motility and concluded that *S. aureus* significantly reduced sperm mobility and viability. *Escherichia coli* was the most common gram-negative bacterium isolated from the semen of the subjects. Ultrastructural examination of electron microscopy showed that *E. coli* adhered to the semen, adhering to the semen causing the acrosomic function to destroy the superstructure and motility of the spermatozoa. *Proteus mirabilis* are other Gram-negative bacteria isolated from the people tested. Scientists have not studied the effect of *P. mirabilis* infection on sperm parameters; It seems to be more correlated with oligozoospermia in our findings, because it is widespread among patients with oligozoospermia and other abnormal sperm characteristics in which oligozoospermia coexist.

CONCLUSION:

This study shows the high incidence of bacterial infection in the sperm of infertile men in Lahore. There was a significant relationship between low semen quality and bacteriospermia in the subjects studied. Bacteriospermia is usually asymptomatic and bacterial semen culture from infertile men should be performed

as routine and appropriate antibiotic treatment in the case of a positive bacterial culture.

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