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The Effect of Bacterial Infection on the Quality of Human's Spermatozoa

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ABSTRACT

Studies represent that bacterial infection of the semen can have a direct role in spermatozoid parameters change and may result in men's infertility. In the present study 160 semens were examines for bacterial infection. 55(34.4%) were infected by different species of bacteria, but those infected only by 4 species were undertaken for further study.These bacteria were Streptococci pyogen, Entrococci, E.coli and Staphylococci. The percentage mean results of morphology for the above bacteria were 25.75, 51.04, 47.86, and 41.50 respectively, while for the sterile samples were 52.84; higher for all but significant for Strep. Pyogen when tested with 95% confidence. The mean grades A, B, C and D from semen infected by the above bacteroi were 28.65, 23.59, 14.86 and 42 percent whereas for the sterile sampleswere 28.51, 30.56, 20.30 and 20.57, respectively. It may be concluded that the bacteria causing genitaltract infection can defect the morphology and the motility of men's spermatozoa.

INTRODUCTION

Infertility is a world wide public health problem which effects couples of reproduction age. One of five married couples demonstrate primary infertility. Despite advance in evaluation, the male infertility is at least 25% idiopathic (1,6,8,11). Presumed mechanisms of infection, causing infertility are the following: (a) Bacterial attachment to sperm; (b) an immobolizing factor produced by some bacteria; (c) immune system recruitment, and (d) alteration of glandular function (3, 14, 17). The pathogenic bacteria in the ejaculates can induce a defect in semen parameters, such a sreduce sperm count, poor morphology and motility (12,14,17). It is already known that these parameters play a vital role in the fertility potential of a man. It is reported that presence of some bacteria in semen is indirect correlation with a decreased sperm count and percentage motility (13). Although many studies agree that bacterial infection if the genital system can be a causitive factor for a significant number of cases of male infertility, there is no consensus as to which genitourinary bacteria are pathogenic to semen parameters (8,10,15).

MATERIALS AND METHODS

In total 160 samples of freshly ejaculated semen of the healthly men referred to there search clinical center for infertility of the Shahid Sadughi University of Medical Sciences of Yazd were tained. Each semen was collected in a sterile wide-mouth container by masturbation after 4 to 5 days of abstinence. After 37°C incubation for 30 minutes, the semens were analysed according to WHO criteria. Sperms were classified a shighly motile (grade A), motile (grade B),moderate motile (grade C), and nonmotile (grade D). For the morphology point of view, semen is considered to be normal if it contains at least 30% sperms with normal morphology.

The isolation and identification of bacteria were carried out according to the standard procedure.

For the purpose of this study, the semen infected with *Streptococcus* group A (*strep. pyogen*), *Enterococci, E. coli, Staphylococcus* coagulase positive (C+) and *Staphylococcus* coagulase negative (C-) were selected.

RESULTS

As mentioned in the method and materials, the semens infected with *strep. pyogen, Entrococci, E. coli, Staph (C+) and Staph. (C-)* were selected. Out of 160 semens, 55 (34.4%) were found to be infected by bacteria. Those infected by the above 5 species were selected for further study (n=43) and the remained 12 samples which were infected by bacteria other than the above species were neglected. The prevalence of such bacteria are shown in Table 1. As it shows, 8, 14, 7, 10 and 4 semens samples were infected by the *Strep. pyogen, Entrococci, E. coli, Staphylococci* coagulase positive *(Staph. C+)* and *Staphylococci* coagulase negative *(Staph.C-)*.

Table 1. **The prevalence of bacteria detected from normal semens**

Type of bacteria	NO.	Percentage
Streptococcus pyogen	8	27.53
Entrococci	14	48.19
E.Coli	7	24.10
Staph.Coagulase+	10	34.42
Staph.Coagulase -	4	13.77
Total	43	29.10

Fig. 1 shows the percentage mean results of morphology of all samples together with the mean average of the infected bacteria against the sterile samples. As it shows, *Strep. pyogen, Entrococci, E. coli* and *Staphylococci* (both *C+* and *C-*) were 25.75, 51.04, 47.86, and 41.50 percent, respectively, while the mean percentage of the morphology of the sterile samples was 52.84 percent. When the average of morphology of the infected

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Fig. 1. **Percentage mean results of morphology and mean average of the infected bacteria against the sterile samples**

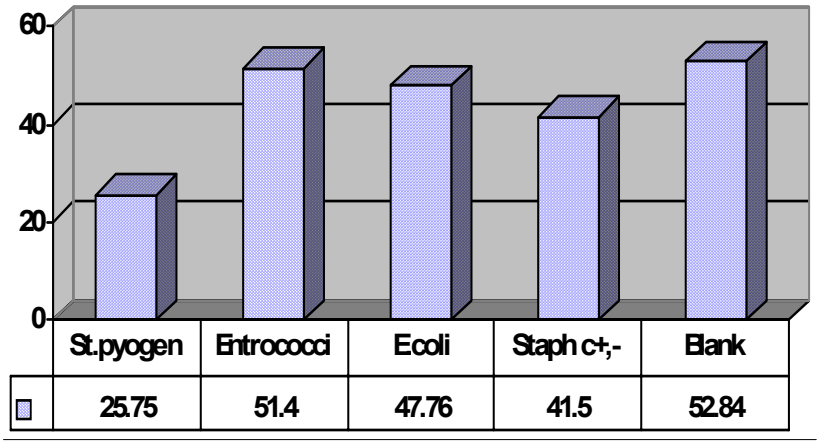
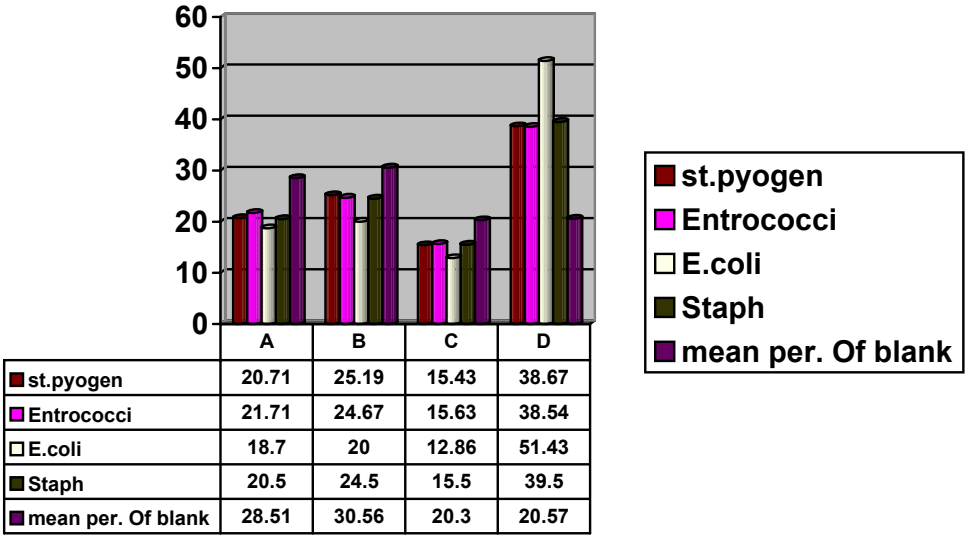


Fig. 2. **Comparison of quality parameters grade of 4 different species against the mean percentage of sterile samples**



	A	B	C	D
st.pyogen	20.71	25.19	15.43	38.67
Entrococci	21.71	24.67	15.63	38.54
E.coli	18.7	20	12.86	51.43
Staph	20.5	24.5	15.5	39.5
mean per. Of blank	28.51	30.56	20.3	20.57

Table 2. **Comparison of quality paeameters grades of 4 different bacterial species**

Quality grades	*St. pyogen*	*Entrococci*	*E.coli*	*Staph. (C+ & C -)*
Highly motile(A)	20.71	21.71	18.70	20.50
Motile(B)	25.19	24.67	20	24.5
Moderate(C)	15.43	15.63	12.86	15.50
Non-motile(D)	38.67	38.54	51.43	39.50

semens were compared against the sterile semen, the difference was found to be significant with 95% confidence.

The quality grade parameters motility of all semen samples were determined. As it is shown in Table 2 and Fig. 2, grade A from spermatozoa infected by *Strep. pyogen, Entrococci, E. coli*, and both *Staphylococci* (C+ and C-) were 20.71, 21.71, 51.70, and 20.50 percent, respectively. Grade B:25.19, 24.67, 20.0 and 24.5 percent; Grade C:15.43, 15.63,12.86 and 15.50 percent and Grade D: 38.67, 38.54, 51.43 and 39.50 precent respectively (Table 3). The mean of grades A,B,C, and D from semens infected by the above were 28.65, 23.59, 14.86 and 42 percent, wherease the mean of grades for strile semens were 28.51, 30.56, 20.30 and 20.57 percent, respectively.

Since only 4 specimens were infected by *Staph. (C-)*, both results of the *staph. (C+)* and *staph. (C-)* were calculated together.

Table 3. **Comparison of the mean of quality parameters against the sterile samples**

Quality grades	Mean infected samples	Mean sterile samples
Highly motile(A)	20.40	28.57
Motile(B)	23.59	30.56
Moderate(C)	14.86	20.30
Non-otile(D)	42.1	20.57

DISCUSSION

The role of bacteria in male infertility remains a controversial subject. Different studies demonstrate that presence of bacteriain seminal fluid has been associated with infertility (11). Changes in sperm parameters that could account for this effect include reduced cell counts (12, 14), reduced motility or morphology alteration (9, 19).

The main objective of this study was to gain some insight into the effect of 5 different bacterial species *(Streptococcus pyogen, Entrococci, E.coli* and *Staphylococcus* coagulase positive and negative) on the quality parameters and morphology of the normal semen.

Out of 160 normal semens tested, 55 (34.4%) were found to be infected. This finding agrees with our previous study (unpublished data) performed in our IVF center. Another investigation examined 100 semens in which 29 (29%) samples were infected by bacteria with the most prevalence of *Enterococci*, similar to our results (18).

As the results indicate, the morphology of semens infected by *Strep. Pyogen* (group A) is significantly lower (25.75%) than the mean average morphology obtained from sterile semens (52.84%), but the rest of species, except *Entrococci,* were noticably lower. When the mean percentage of morphologycal culated and compared with the mean percentage average of sterile semens, the difference was significant with 95% confidence.

Although some investigators believe that the presence of bacteria has no direct effect onthe morphology of stermatozoa (9, 19) others claimed that bacteria can strongly defect the morphology of spermatozoa (9, 10, 12, 16).

From the view of quality parameters, difference betweem the mean of grades A, B,C and D from infected semens against the sterile semens (Table 2, 3 and Fig. 2) was found to be significant with 95% confidence. Although some authors have not confirmed the role of bacteria in impairment of sperm's motility (2, 5, 7) many other researchers demonstrated that bacteria can directly interfere with sperm metabolisms and spermtail motility (4, 9, 10, 12, 14, 17). Some research workers demonstrated an immobilizing factor produced by *E. coli* that showed the greatest effect in ligospermic semen, though, the responsible factor has not been isolated (14).

In conclusion, the results obtained from this study indicate that the bacteria causing genital tract infection could have a defecient role in morphology and the evaluation motility of men's spermatozoa.

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