

Short Communication

Current studies on bacterospermia the leading cause of male infertility: a protégé and potential threat towards mans extinction

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Abstract

Background: The current rise of male infertility associated with bacterospermia and urogenital infection has been on the increase amongst adult married males in Benin metropolis and a major cause of concern to male fertility and reproduction in Nigeria. **Aim:** To microbiologically isolate and study the infectious agent that has led to male infertility and also to study the percentage occurrence of bacterospermia and urogenital caused infertility in adult married males in Benin metropolis **Material and Method:** using standard microbiological methods of isolating and identifying the organism, specimen was collected and processed which includes the susceptibility profile of isolates and sperm quality. In this study a total of 140 sperm samples was collected from patient who were referred from the consultant outpatient department of the University of Benin Teaching Hospital and then evaluated bacteriologically using standard bacterial cultural methods **Results:** Among the total cases, 92 (65.7%) showed at least one pathogen. *Staphylococcus aureus* (28.3%), *Staphylococcus Saprophyticus* (13.0%), *Pseudomonas aerouginosa* (6.5%), *Escherichia Coli* (19.6%) *Proteus mirabilis* (10.8%) *Klebsiella spp* (10.8%) and *Proteus vulgaris* (10.8%). **Conclusion:** There was an outstanding significant relationship between bacterospermia and the rate of total motility and morphologically abnormal sperms, The percentage of morphologically normal sperm was lower in this study. *Staphylococcus aureus* *Staphylococcus saprophyticus* and *Escherichia coli* were the most common pathogen having negative effects on sperm motility and morphology in this study.

Keywords: Bacterospermia, sperm quality, Infertility, urogenital.

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Introduction

Male urogenital tract infections is one of the most important causes of bacterospermia and male infertility worldwide. Genital tract infection and inflammation have been associated to 8-35% of male infertility cases [1, 7, 8]. Asymptomatic bacterospermia may play a major role [2, 9]. Male accessory sex glands infection is a major risk factor in infertility [5].

The significant of pathophysiology of bacterospermia has been discussed in recent years. Some possible pathomechanisms of the development of infertility linked with infection are considered: direct effect on sperm

function (motility, morphology, etc), deterioration of spermatogenesis, auto-immune processes induced by inflammation and dysfunction of accessory sex glands [2, 8]. Hence, microbiology investigation of male partners in infertile couple can be useful to detect the male urogenital tract infection, especially asymptomatic infections.

The aim of this study was to investigate microbiology semen samples of infertile men.

Patients and Methods

Semen sample of 140 infertile men attending the infertility Consultant out-patient Department of the University of

Benin Teaching Hospital were collected by masturbation, after a 3 days abstinence period. Patients should not have taken any antibiotic one week before collection of semen sample. Before collection, patients were advised to wash their hands and genital area with soap and water. Samples were collected into sterile universal containers.

All specimen collected were rapidly transferred to Microbiology Laboratory and processed according to the method of Cheesbrough 1984. Culture was incubated at 37 °C for 24-48 h. Semens were prepared on each sample on a slide and stained with gram staining techniques. All emergent colonies from culture were identified according to the criteria of Cowan and Steel 1985. Standard analysis of semen parameters was performed according to WHO, guidelines[10]. Nigrosin-Eosin Staining Technique and Sodium Bicarbonate formalin fluid diluted 1/20 were used for the enumeration of sperm cells morphology and sperm count respectively. Control semen from fertile male patient was also treated according to the WHO guidelines on semen examination and evaluation.

Results

Out of a total number of 140 specimen processed, 92 (65.7%) yielded bacterial growth with *Staphylococcus aureus*, *S. saprophyticus* and *Escherichia coli* having the highest incidence rate of 28.3%, 19.6% and 13.0%, respectively. Trailing behind these were *Proteus mirabilis* 10.8%, *Klebsiella pneumonia* 10.8% and *Proteus vulgaris* recorded 10.8% each respectively. *Pseudomona aeruginosa* had 6.5% (Table 1).

Using Chi-square statistical analysis, there was a relationship between Bacterospermia and Quality from these male infertile patients (Table 1), the susceptibility profiles of these organism to the various antibiotics showed a remarkable drug resistant pattern which may be a cause of reoccurrent drug resistant bacteriospermia.

The was a total of 97% susceptibility to Imipenem and *Staphylococcus aureus* and *Staphylococcus saprophyticus* had a 92% susceptibility to Vancomycin and 7.8% resistance to vancomycin, there is the increase in the resistance of Imipenem with 2.1% occurrence this is shown in (Table 2).

Discussion

In this study 92 (65.7%) out of a total number of 140 semen samples from infertile males collected yielded bacterial growth. In Table 1, *Staphylococcus aureus* (28.3%), *S. saprophyticus* (13.0%) and *Escherichia coli* (19.6%) were the main organisms with the most negative influence on sperm motility and morphology. [6, 7, 11, 12]. There was a definite relationship between Bacterospermia (Bacterial Isolates), Leucocytes (Puscells) and Total sperm count ($P < 0.001$). The immobilization effect of certain bacteria particularly *Escherichia coli* had been reported [7]. The rate of non-motile sperm cells and abnormal morphology was also established through WHO 1999

evaluation techniques and was found to be affected by these bacterial isolates. The antimicrobial susceptibility profile showed that most of the organism are becoming drug resistance and also the increasing resistance to Vancomycin and Imipenem. Generally the risk of infertility increases by age but most of our investigated patients were young. The idea that bacterial infection may be partly responsible for male infertility arises from the clinical observation of the patients' male reproductive system. Male urogenital tract infection is one of the most important causes of male infertility worldwide [1, 2, 7]. Infection processes may lead to deterioration of spermatogenesis, impairment of sperm functions, and obstruction of the seminal tract [8]. In-view of the above, there is the need to institute a Microbiological intervention to detect the probable microbial agents. It should be noted that presence of urogenital tract infection and inflammation poses a danger to the fertility profile of male patient and should be eradicated by the use of appropriate prescribed antibiotics and anti-inflammatory treatment. Therefore, because of the important role of bacteriospermia in male infertility, more attention should be attached to young sexually active men health in this study.

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Tables 1 Bacterial isolates: morphology and sperm motility

Bacterial Isolates (%)	% Sperm Morphology/Abnormal	% Total Sperm Motility
Staphylococcus aureus 26 (28.3%)	90	20
Escherichia coli 18 (19.6%)	90	30
Staphylococcus saprophyticus 12 (13.0%)	80	10
Klebseilla spp 10 (10.8%)	70	20
Proteus mirabilis 10 (10.8%)	80	10
Proteus vulgaris 10 (10.8 %)	60	10
Pseudomonas aeruginosa 6 (6.5%)	60	20
Total 92 (65.7%)		

Table 2 Bacterial susceptibility profile

Bacterial isolates	CAZ	CRO	LIN	CN	CXM	VAN	IMP	F	OFX	CTX	OB
Staphylococcus aureus	S-12 R-14	S-12 R-14	S-16 R-10	S-20 R-6	S-18 R-8	S-23 R-3	S-25 R-1	S-8 R-18	S-10 R-16	S-15 R-11	S-10 R-16
Escherichia coli	S-8 R-10	S-9 R-9	S-6 R-12	S-12 R-6	S-10 R-8	S--- R---	S-18 R-0	S-10 R-8	S-12 R-6	S-6 R-12	S-4 R-14
Staphylococcus Saprophyticus	S-8 R-4	S-8 R-4	S-10 R-2	S-10 R-2	S-8 R-4	S-12 R-0	S-12 R-0	S-9 R-3	S-5 R-7	S-7 R-5	R-10 S-2
Klebseilla spp	S-6 R-4	S-4 R-6	S-8 R-2	S-7 R-3	S-6 R-4	S--- R---	S-10 R-0	S-8 R-2	S-6 R-4	S-7 R-3	S-1 R-9
Proteus vulgaris Proteus mirabilis	S-12 R-8	S-13 R-7	S-15 R-5	S-10 R-10	S-15 R-5	S--- R---	S-19 R-1	S-16 R-4	S-12 R-8	S-11 R-9	S-7 R-13
Pseudomonas aeruginosa	S-1 R-5	S-3 R-3	S-4 R-2	S-2 R-4	S-2 R-4	S--- R---	S-6 R-0	S-4 R-2	S-1 R-5	S-4 R-2	S-1 R-5
Total	S-47 R-45	S-49 R-43	S-59 R-33	S-61 R-31	S-59 R-33	S-35 R-3	S-90 R-2	S-55 R-37	S-46 R-46	S-50 R-42	S-33 R-59

R: resistance, S: susceptible, CAZ: ceftazidime, CRO: ceftriaxone, CN: gentamycin, LIN: lindamycin, CXM: cefotaxime, VAN: vancomycin, IMP: imipenem, OFX: ofloxacin, OB: oxacillin.