

Original Article

Leucocytospermia –does it mean anything?

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Abstract

Leucocytospermia is the nomenclature given to semen sample containing more than 1 mill/ml leucocytes. This is often considered to be a sign of infection and patients are given broad spectrum antibiotics. The objective of this study is to find out the significance of leucocytes in semen samples of patients attending our infertility clinic. **Design:** It is a retrospective observational study. **Setting:** Dept of Reproductive Medicine, Chettinad Hospital, Chennai (August 2009 - July 2011). **Patients:** All patients who came for routine semen analysis and had round cells more than 5 mill/ml were assessed. This study was a retrospective study done with records available in the department of reproductive medicine and not involving the patients directly. Hence Institutional review board (IRB) approval was not required and therefore was not obtained. **Main outcome measures:** The semen samples of such patients with > 5mill/ml round cells were subjected to peroxidase test and those who had leucocytes more than 1 mill/ml were checked for seminal infections through semen culture reports and antibiotic treatments, if any.

Results: Among the 2447 patients who came for routine semen analysis, 196 had round cells more than 5 mill/ml with an incidence of 8%. All the 196 patients were tested for leucocytes using peroxidase test and 39 tested positive for leucocytes more than 1 million/ml (39/196=19.89%). These 39 patients were advised semen culture, and only 23 had semen culture done. Seven of them were reported culture positive (incidence of 30.43% i.e. 7/23). The remaining 16 had no growth of any pathogens. Among the 7 with a positive culture report, one showed significant growth, and 2 had moderate growth. They were put on antibiotics after discussion with the microbiologist. Most of them were asymptomatic except for one patient who complained of burning micturition. His urine culture was also positive for the same organism. Four of the patients had very minimal growth and were not treated with antibiotics.

Conclusion: According to this observational study, leucocytospermia was not associated with clinical symptoms or bacteriospermia as the culture yielded no growth or insignificant growth of any organisms in majority of the patients.

Key Words: Leucocytes, Round cells, Bacteriospermia

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Introduction

Semen analysis is a valuable diagnostic tool which guides us to choose the treatment modality in male infertility. Routine semen analysis includes the estimation of round cells in semen which may be epithelial cells, immature germ cells or white blood cells¹. When round cells by routine semen analysis are more than 5 million /ml, then their identity has to be established by peroxidase test.

The reagent used for peroxidase test contains H₂O₂ and DAB (diaminobenzidine-an indicator). The principle behind this is the oxidation of DAB by H₂O₂, in the presence of peroxidase enzyme that is present in the leucocytes. Oxidation is indicated by the colour change of the round cells from pink to brown.

H₂O₂ + DAB (pink) → oxidized-DAB (brown)

According to WHO 2010 guidelines, Leucocytospermia is defined as the presence of more than 1 mill/ml leucocytes in the semen sample². However whether the presence of leucocytes in the semen sample is pathological or physiological is still debatable. The question whether it indicates a normal function or a

clinical infection is yet to be answered as it is seen in 10% of fertile men also³.

Studies have shown that even at high concentrations, presence of leucocytes alters neither sperm fertilization ability nor the probability of clinical pregnancy in fertile men. Even ART outcomes are not influenced by the presence of leucocytospermia³.

However, it is common knowledge that leucocytospermia produces Reactive oxygen species which in combination with nitric oxide causes peroxidative damage to the plasma membrane and DNA integrity and thereby interferes with fertilizing capacity and motility of spermatozoa^{4,5}.

In concurrence to this, there is reported increase in the incidence of leucocytospermia among infertile men, ranging from 15-28%, with or without associated In concurrence to this, there is reported increase in the incidence of leucocytospermia among infertile men, ranging from 15-28%, with or without associated symptoms⁶. With the background of contradictory evidences regarding the physiological or pathological significance of leucocytospermia, this observational

study was conducted in order to find out the role of leucocytes in semen samples of infertile patients.

Methodology

It is a retrospective observational study done in the Dept of Reproductive Medicine, Chettinad Hospital, Chennai. This study was a retrospective study done with records available in the department of reproductive medicine and not involving the patients directly. Hence Institutional review board (IRB) approval was not required and therefore was not obtained.

Data collection

Data of patients who had round cells more than 5 mill/ml in a routine semen analysis from August 2009 - July 2011 were included in this study. The data of semen culture reports and subsequent antibiotic treatment for patients who had leucocytes more than 1 mill/ml by peroxidase test was noted and analyzed.

Results

Among the 2447 patients who came for semen analysis 196 had round cells more than 5 mill/ml giving an incidence of 8%. All the 196 patients were tested for leucocytes using peroxidase test and 39 had leucocytospermia (39/196=19.89%). These 39 patients were advised semen culture, but only 23 were compliant. Among the 23, only seven had reported culture positive. The remaining 16 had no growth of any pathogens. Among the 7, one showed significant growth, and 2 had moderate growth. They were treated with antibiotics after discussion with microbiologist though they were asymptomatic except one whose urine culture had the same organism. Four patients had very minimal growth and were not treated with antibiotics. One of the patients who showed cultured negative underwent an ART cycle (ICSI) resulting in the birth of a healthy girl baby.

Discussion

Leucocytospermia need not always be pathological but can also be physiological, as not all leucocytes are associated with infection. Though bacterial growth is seen in samples with leucocytospermia, this could be attributed to contamination of the semen sample with bacterial flora from the skin, prepuce, hands, urethral meatus and urine⁷. Leucocytospermia does not necessarily mean infection. Approximately 80% of patients with leucocytospermia do not have bacteriospermia⁸ and even normozoospermic patients sometimes show growth of pathogens in semen culture⁹. Leucocytes usually originate from epididymis but the origin of the leucocytes in men with leucocytospermia is not clear⁸. Sometimes leucocytospermia can be associated with urinary tract infection. When asymptomatic bacteruria is not treated with antibiotics, then it seems unnecessary to treat patients with asymptomatic leucocytospermia. Few studies have found that leucocytes count in semen samples shows intra-individual variations with one analysis showing >1 mill/ml leucocytes vis-a-vis another with none¹⁰. So empirical therapy with antibiotics for leucocytospermia is not necessary. A repeat semen analysis, semen culture and a urine culture (if the patient is

symptomatic) will help to treat the patient more efficiently than empirical therapy with antibiotics.

The correlation of leucocytospermia with infertility, if any, could not be deduced from this study due to its small size. Larger randomized studies will help to understand the influence of leucocytospermia on infertility and whether treatment with antibiotics is beneficial in such cases.

Conclusion

According to this observational study, leucocytospermia defined as leucocytes more than 1 mill/ml (WHO 2010) was not associated with clinical symptoms or bacteriospermia by culture. So larger studies are required to see if leucocytospermia is an indicator of infection in the male and its influence on fertility. However, our study has shown that empirical therapy with antibiotics is not necessary in asymptomatic leucocytospermia.

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Authors declare no conflict of interest.

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National Apex Committee for Stem Cell Research and Therapy (NAC – SCRT) joins forces with ASCI, India (Mumbai, Feb 10, 2015).

The National Apex Committee for Stem Cell Research and Therapy (NAC-SCRT) joins hands with Advertising Standards Council of India (ASCI) to monitor advertisements that claim stem cell based therapies. As per the National Guidelines for Stem Cell Research- 2013 there are no approved indications for stem cell therapy other than the Hematopoietic Stem Cell Transplantation (HSCT) for haematological disorders. NAC-SCRT has observed that several clinicians / companies / hospitals advertise stem cell based therapies other than haematopoietic stem cell transplantation for haematological disorders on their websites. These therapies are currently investigational and must be conducted only within the scope of clinical trials. Such misleading advertisements are to be removed and action be taken against the defaulters unless they are suitably modified to clarify the unproven nature of these therapies.

Prof. Alok Srivastava, Chairman, NAC-SCRT has clearly stated that such advertisements are in violation of the clause 10.3.1 of the National Guidelines for Stem Cell Research-2013. Use of stem cells for any other purpose outside the ambit of clinical trials will be against these guidelines and is hence not permissible. ASCI has already initiated action against 23 such websites. It is good to note that several advertisers have immediately started amending the web-site content.

- Prof. RM. Pitchappan