SEROPREVALENCE OF ANTI-CHLAMYDIA TRACHOMATIS IgG ANTIBODY IN EKPAN COMMUNITY OF DELTA STATE, NIGERIA

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Article Received on 17/07/2015 Article Revised on 08/08/2015 Article Accepted on 01/09/2015

ABSTRACT

Chlamydia trachomatis, an obligate intracellular human pathogen, largely known to be asymptomatic, is the most common bacterial cause of sexual transmitted infection in men and women. The aim of our study was to determine the prevalence of Chlamydia trachomatis associated infertility in men and women that came for treatment at Government Hospital Ekpan, Delta State. Two hundred and fifty subjects (250) comprising 200 (80%) patients that came for infertility treatment and 50 (20%) control subjects that made up of hospital staffs were screened. Venous blood were collected from all of them and screened for Chlamydia trachomatis by Enzyme Immunosorbent Assay (EIA) method. Semen were collected from men and processed for microscopy, count and morphology by standard methods. The overall prevalent rate of Chlamydia trachomatis in this study was 67.5%. The result of this study showed that Chlamydia trachomatis antigen was higher in female (70.8%) when compared to the male (64.4%). There is strong evidence that Chlamydia trachomatis infection may be one of the causative agents for male and female infertility in Ekpan community.

KEYWORDS: Chlamydia trachomatis, Infertility, Antigen, Infection
INTRODUCTION

Infertility is the inability to conceive, carry pregnancy to full term or father a child after unprotected intercourse for a period of one year. The time needed to pass (during which the couple tries to conceive) for that couple to be diagnosed with infertility differs between different jurisdictions.\textsuperscript{1} This condition affects approximately 10-15\% of reproductive-aged couples. Infertility affects both male and female. It is a big problem worldwide particularly the underdeveloped countries. Chlamydia trachomatis (Ct) is an obligate intracellular gram negative bacterial pathogen. Ct infection is a major and increasing public health problem worldwide. Currently, it is the main cause of sexually transmitted infection. It is the leading cause of pelvic inflammatory disease in women.\textsuperscript{2} In 1999, World Health Organization (WHO) estimated that 92 million new Chlamydia infections occurred worldwide.\textsuperscript{3} A major problem of Chlamydia trachomatis infection is its asymptomatic nature. Chlamydia trachomatis infection may often pass unnoticed and be under-diagnosed, facilitating its spread, which is mainly associated with sexual risk behavior. It causes infertility in both men and women. It has been observed that persistent Chlamydia trachomatis infection can result in the scarring of ejaculatory ducts or loss of stereocilia.\textsuperscript{4} Men with Oligospermia and Azospermia will result in infertility problem. Looking at sperm microscopically will help in the diagnosis of infertility in men. In addition to changes in sperm quality, there is growing evidence to suggest that exposure to Chlamydia trachomatis can affect sperm function.\textsuperscript{5,6} Recent studies have implicated Chlamydia trachomatis as one of the major cause of pelvic inflammatory disease which may lead to subsequent infertility.\textsuperscript{7} In most parts of Nigeria, trachomatis are not routinely screened for, and hence relative information about frequencies of the organisms is sparse.\textsuperscript{8} In the last few years, the incidence of this infection has increased, partly due to a false sense of security created by antiviral HIV therapy in some sectors of the population, leading to carelessness in the use of preventive methods during sexual relations, thus facilitating sexually transmitted infection. High risk of infection has been described in persons with a low socioeconomic position and in substance abusers, due to low awareness in these population groups. Moreover, in Chlamydia trachomatis-infected individuals, there is a greater risk of acquiring and, in the case of coinfection, of transmitting other sexually transmitted infection due to the inflammatory alterations produced in affected genital mucous membranes.\textsuperscript{9}
The above implications lead this work, which is to look at the serological pattern of *Chlamydia trachomatis* antibody detection in the participating individuals with case of infertility to see if they are suggestive of *Chlamydia trachomatis* infections or other factors.

**MATERIALS AND METHODS**

**STUDY AREA**

Ekpan is one of the densely populated crude oil refining towns in Delta State Mid West Nigeria which is surrounded by two major Local Government Areas which are Warri and Udu. It is predominately inhabited by crude oil workers.

**STUDY DESIGN**

A total of two hundred and fifty (including Patients and controls) men and women were used for this study. The test subjects (200) were drawn from patients attending Government Hospital Ekpan, Delta State, Nigeria. While the control subjects were drawn from the general population comprising of the hospital staff and healthy men and women in Ekpan’s environ. The age of these Participants ranges between 18-45years. Patients and control subjects were screened for *Chlamydia trachomatis* by Immunocomb *Chlamydia trachomatis* IgG test. Those included in this study are clinically confirmed patients that had primary and secondary infertility problem. While Pregnant women, Malignancy demanding cytotoxic chemotherapy or radiation therapy patients, Children, Men and women above 45years were excluded. Ethical approval for this study was obtained from Government Hospital Ekpan Warri, Delta state.

**SAMPLE COLLECTION**

A total of 2ml of venous blood was collected by venipuncture under aseptic condition using a sterile disposable syringe and needle from each of the patients into Plain containers and labeled. The blood samples in plain containers were allowed to clot and after clot retraction the samples were spun with bucket centrifuge and samples separated into plain containers for Chlamydia assay. The blood samples were analyzed by Immunocomb *Chlamydia trachomatis* IgG test (ORGENCIC PRODUCT, ISREAL).

The principle of the test is based on antibody antigen reaction in which when serum is introduced into the well containing Chlamydia trachomatis antigen a chromogenic component formed resulting in a gray-blue spots on the teeth of the card. Prior to the collection of the sperm specimen, patient was asked to abstain from sex for three day. No drinking of alcohol
and no use of condom. This was done in order to obtain an accurate result. Patient was also instructed to get to the laboratory within thirty minutes to one hour of collection of the sperm specimen. Sperm samples were collected into labelled universal containers. Microscopic examination of semen was done by method of Ochei and Kolhatkar.\[10]\] Following the submission of the sperm specimen to the laboratory, the collection time, examination time, volume, PH and the liquelified time was noted. Well mixed and liquelified semen of about 1 drop ((10-15µl) was placed on a clean slide and covered with 20 x20 x22 x 22mm glass cover. The prepared slide was examined using the x10 objective lens of the microcopy by viewing several fields to access motility. The next step was the sperm count, sperm count was done by making one in ten dilutions of sperm diluting fluid (sodium bicarbonate formalin diluting fluid) and diluted specimen was properly mixed and a Pasteur pipette was used to fill in a Neubauer counting chamber with the diluted specimen. This was allowed to stand for 3-4mins to allow the spermatozoa settle. Then sperms cells were counted using the x10 objective lens. The sperm count was determined by counting the number of spermatozoa in two large square ie area of 2 square millimeter (Sq.mm) and then result calculated by multiplying the number counted by 100000. Normal count was 20 x 10^6 spermatozoa /ml or more. Count less than 20 x 10^6/ml are associated with male sterility.

**RESULTS ANALYSIS**

A total of 200 patients were screened for the presence of *Chlamydia trachomatis* infection, comprising 104 (52%) males and 96 (48%) females, with an overall positivity rate of 135 (67.5%) (Fig 1). The study showed that *Chlamydia trachomatis* infection was more prevalent among females 68 (70.8%) compared to their male counterparts having 67 (64.4%) positivity (Fig 2). The result showed that 37 (35.6%) of the male patients were negative while 28 (29.2%) of female patients were negative to *Chlamydia trachomatis* infection. The average sperm count for infertile men with *Chlamydia trachomatis* infection was 7×10^6/ml, while the sperm count for fertile men without *Chlamydia trachomatis* infection was 23×10^6/ml (Fig 3).
Fig 1: Number of male, female and total number that tested positive to Chlamydia trachomatis infection, Abbreviations,N=Number, M=Male, F=Female, TNP=Total number positive.

Fig 2 showed percentage of male and female positive, male and female negative, total number positive and total number negative, Abbreviations, PM=Positive male, NM=Negative male, PF=Positive female, NF=Negative female, TNP=Total number positive, TNN=Total number negative.

Fig 3 showed average sperm count of fertile and infertile men, Abbreviation, M=Million or $10^6$
DISCUSSION
Determination of the prevalence of the most common causes of sexual transmitted infection in this part of Nigeria known as Ekpan surrounded by Warri city is very crucial because of the important of that city to the whole country. The city of Warri is one of the major hubs of petroleum activities and businesses in the southern Nigeria. It is a commercial capital city of Delta State, with a population of over 311,970 people according to the national population census figures for 2006. The city is one of cosmopolitan cities in southern Nigeria comprising originally of Itsekiri, Urhobo and Ijaw people. In order to continue to create awareness on the need to pay special attention on the adolescent and their sexual and reproductive health (RH), this study determined the prevalence of *Chlamydia trachomatis* in Ekpan community of Delta state. The overall prevalence rate of Chlamydia trachomatis antigen positivity was (67.5%), this is higher to a study done at Portharcourt, Nigeria which reported an overall rate of 11%. The same result is also higher to a study done in Enugu, 9.8% reported in Ogun state and 33.0% reported on asymptomatic volunteers. The high prevalence of *Chlamydia trachomatis* infection in this study is comparable to 68.25% reported in female sex workers in Niger Republic. Possible explanation for higher prevalence obtained from this study could be attributed to several factors such as treatment seeking behavior for STIs in the region, because there was a report that in Delta State, 62.9% of adolescents had their STI treated in a health centre, while 25.8% were treated by patent medicine store and 4.8% were treated by traditional healer. Another explanation could be Socio-cultural factors where a varied proportion of parents do not discuss sex and sexuality with their children. Another explanation could be low access to Adolescent Friendly Reproductive Health Services (AFRHS). This is in accordance with report of UNFPA baseline survey in Delta state which showed that majority of respondents in both urban and rural areas do not know of youth service centre in their locality, and also out of 240 Reproductive Health facilities that were inspected in Delta state only 16% had space for adolescent service and only half of these say they provide youth friendly service. This study agrees with previous studies in some other places in Nigeria and outside Nigeria that reported higher prevalence of Chlamydia trachomatis infection in female when compared to their male counterpart. Possible explanation for higher prevalence of Chlamydia trachomatis in female more than male in this study could be attributed to several factors such as antibody detection method used in this work which detect many more cases than the other screening methods. It could be due to Gender norms and values in Niger Delta Region (NDR). Research showed that many cultures in the NDR show preference for the male child,
accord him privileges often to the exclusion of the female child. So female receive little or no education and at a low socio-economic stratum with sex as the only bargaining tool.\[21\] Another reason could be Socio-economic factors such as common life style of female adolescents in NDR (oil producing area) being lured into prostitution and also engagement as part-time commercial sex work with male workers in the oil and allied industries in other to maintain a high social life style.

In conclusion, the prevalence rate of *Chlamydia trachomatis* (*Ct*) infection was higher in both male and female infertility in Ekpan community in Delta state. Government should make screening of *Chlamydia trachomatis* mandatory in routing Medical Laboratory test in all private and government own Health institutions. This will enable the detection of asymptomatic *Chlamydia trachomatis* infection that causes infertility and prevent its spread. Effective management and treatment should be devised. Furthermore, more research work should be done in order to develop vaccine against the bacteria *Chlamydia trachomatis*.

**COMPETING INTERESTS**

Authors have declared that no competing interests exist.

**REFERENCES**


