DistributionRateofChlamydialInfectionAccordingtoDemographicFactorsamongWomenAttendingClinicsinZariaMetropolis,KadunaState,Nigeria

ABSTRACT

Chlamydia trachomatis also known as the “Silent Epidemic” is a major threat to the reproductivehealth of women. Thisstudy was aimed at determining the seroprevalence of *Chlamydia trachomatis* based one demographic factors among women attending clinics in Zaria metropolis, KadunaState. Each participant completed a researcher-devised questionnaire and quasi design was usedin the selection of hospitals. Subsequently about 5mls of peripheral blood for serological analysiswas obtained after informed consent. Presence of antibodies to*Chlamydia trachomatis* wasdetermined using Enzyme Linked ImmunosorbentAssay (ELISA) todetectIgG and screeningfor HIV was also done using Determine® HIV 1/2 as well as Uni-Gold™ HIV Test Kits. Out ofthe two hundred and seventy (270) samples collected, 32(11.9%) were positive for *Chlamydiatrachomatis* IgG, 7(2.6%). Chlamydial infection was found to be significantlyassociated with level of education.There was no significant associationbetweenchlamydialinfectionandoccupation,subjects’husbands’occupation.

***Keywords**: DistributionRate,ChlamydialInfection,DemographicFactors, pregnantWomen*

INTRODUCTION

The genus *Chlamydia*belongs tothe taxonomic family *Chlamydiaceae*, which alsocontainsthegenus*Chlamydophila*(BushandEverett,2001).Thegenus*Chlamydia*includesthehuman*Chlamydiatrachomatis*,themousepathogenic*Chlamydiamuridarum*,theavian*Chlamydiapsittacis*,theswine*Chlamydiasuis*and*Chlamydiapneumoniae.Chlamydiatrachomatis* (CT) is a small Gram-negative bacterium that is an obligate intracellular parasite(McAdam*etal.*,2005).

Genitalinfections with *Chlamydia trachomatis* arethemostcommon sexually transmittedbacterial infections in European countries (Fenton and Lowndes, 2004; Manavi, 2006), in theUnited States (Miller *et al.*, 2004; Schillinger *et al.*, 2005) and worldwide, with more than 90millioncasesannually (Coonrod,2002).TheCentresforDiseaseControl andPrevention(CDC, 2010) estimates thatthere are approximately 2.8millionnewcases of *Chlamydia*inthe United States each year and that about one million individuals in the United States areinfected with *Chlamydia* (CDC, 2010). It has also been reported as an established cause ofpelvicinflammatorydisease(PID),ectopicpregnancyandinfertilityamongwomen(Oakeshott and Hay, 1995). Although the major impact of the disease is on the female genitaltract (Fenton and Lowndes, 2004; Manavi, 2006), men may suffer from urethritis, prostatitis,infertility and Reiter's syndrome (Manavi, 2006). *Chlamydia trachomatis* is also the causativeagentof trachoma, a chronic infection of the conjunctiva characterized by extensive scarringandblindness.

Sexually transmitted infections (STIs) contribute to a variety of obstetric and gynaecologiccomplications in women, including increased risk of tubal infertility and have been associatedwithchronicpelvicpain.Theyarealsosignificantlyassociatedwith adversepregnancyoutcomessuchasspontaneousabortion,pretermdelivery,ectopicpregnancy,premature rupture of membranes,intrauterineinfection of thefoetus,andlowbirth weightininfants(Mardh,2002).

MATERIALSANDMETHODS

StudyArea

The study was conducted among pregnant and non-pregnant women attending clinics in Zariametropolis,Kaduna State,Nigeria.

StudyDesign

The study was a descriptive cross-sectional survey which combines the use of

administeredstructuredquestionnairesandtheanalysisofserumsamplescollectedfromconsentedpatients.Quasidesignwasadoptedforthepurposeofthisstudy.

Ethicalapproval

Approval wasobtainedfrom the ethical committee of thevariousHealth Care Centres beforethecommencementof theresearchinAugust2012.

Inclusioncriteria

Womenreceivingantenatalcareandnon-pregnantwomenatthevarioushealthcentresduring the period of study who gave consenttoparticipatein the study aged <15-50yearswithorwithoutHIVwereeligibleforinclusion).

Exclusioncriteria

Womenreceivingantenatalcareandnon-pregnantwomenatthevarioushealthcentresduring the period of study whodo notgive their consent toparticipate in the study aged <15-50yearswithorwithoutHIVwerenoteligibleforinclusion.

Samplesize

The sample size was determined using the following equation as described by Naing *et al.*(2006).

$$n=\frac{z^2p(1-p)}{d^2}$$

Wheren=samplesize

z=zscoreforalevelof95%confidenceinterval=1.96

p=prevalencerateat10.5%Zaria,Nigeria(Muhammad*etal*.,2009).d=allowableerror=5%=0.05

Therefore:

$$n=\frac{(1.96)^2x0.105x(1–0.105)}{(0.05)^2}$$

=144.406

=144samples

Attritionrate=10%of144samplesize

=158.4

=158samples

A total of 270 samples were collected (equal number of samples were collected to make goodcomparisonbetweenthesubjects).

QuestionnaireAdministration

Astructuredquestionnairewasadministeredafterinformedconsentwasobtainedfrom thestudy populationin order toaccess the riskfactors associated with theprevalenceof*Chlamydiatrachomatis*amongpregnantandnon-pregnantwomen.Parametersconsideredincludedoccupation,husband'soccupation and educational level

SampleCollection

Blood samples were collected from women of reproductive age <15-50 years who gave theirconsent. Approximately twohundredandseventy (270)bloodsampleswere collectedfromonehundredandthirtyfive(135)pregnantandonehundredandthirtyfive(135)non-pregnantwomenattendingclinicsfromeachofthecentresunderstudyinZaria.

Allmaterialsrequiredforthecollectionofvenousbloodwasassembledandlabelledappropriately with thesubject'sidentification number(ID)anddate.Five mililitre of bloodwas collected through venepuncture using sterile 5ml needles and syringes (CHANGZHOUHUICHUNMEDICALEQUIPMENTCO.,LTD,CHINA-Expirydate:02-2016).The blood sample in the syringe was released into the labelled container and allowed to clot for 30minutes. This was followed by centrifugation of the collected blood sample to separate theserum at3000r.p.m.for 5minutes.The serum wasthereaftercarefully separated with atransfer pipette in order to avoid extracting red cells and aseptically transferred into a sterilelabelled serum storage screw-capped container. The serum was stored in the Microbiologylaboratoryinafreezeratatemperature

of-20°Cuntilit gotanalyzed.

CTScreeningUsingEnzymeLinkedImmunosorbentAssay(ELISA)

AssayProcedure

Allreagentsfortheassaywerebroughttoroomtemperature(20^{0}C-25^{0}C)fromatemperatureof 2^{0}C-8^{0}C andthoroughly mixedby swirlinggently before use. Samples were numberedaccording to themicrotitre wells. The desired number of coated strips was placedinto theholder.Fivemicrolitre(5µl)ofthetestsamples,negativecontrol,positivecontrolandcalibrator control were added to 200 µl of the sample diluents to make 1 in 40 dilutions. Onehundredmicrolitres(100µl)ofdilutedsera,calibratorandcontrolswasdispensedintoappropriate wells. For the reagent blank, 100µl sample diluents were dispensed into 1A wellposition. The holder was tapped so as to remove air bubbles, mixed well and incubated for 30minutes at room temperature. The liquid from all the wells were removed and wells washedthreetimeswithwashingbuffer.

Onehundred microlitres (100 µl) of the enzyme conjugate was alsodispensed intoeach welland the plate incubated for 30 minutes at room temperature. Excess enzyme conjugate wasremovedby washing each well with washingbufferthree times.Approximately,100µl ofTMBchromogenicSubstratewasdispensedintoeachwellandincubatedatroomtemperaturefor30minutes.Onehundredmicrolitres(100µl)of2NHClwasfinallyaddedtostop the reaction.There was a colour change from blue toyellowand within15minutesthe plates wereread atan absorbance of 450nmusingamicrowell reader(WKEA MEDSUPPLIES,CHANGCHUN,CHINA–Expirydate:08-2013).

DataAnalysis

Results and data from questionnaires were presented on tables andfigures.All statisticalanalysis was done using a computer software program, SPSS Version 19. Associations andrelationship between the various risk factors were obtained using chi-square, fisher's exact,analysisofvariance(ANOVA)andthestudentt-test.TwotailedPvalues≤0.05wasconsidered tobestatistically significant.

RESULTS

Table1illustratesthedistributionofchlamydialinfectionbasedonoccupationandeducationallevel.Thoughtherewasnostatisticallysignificantassociationbetweenstudysubjects' occupation and chlamydial infection,therearevariationsin thevarious types ofoccupation with civil servants having 3(9.7%),self-employed 2(4.3%)andothers 9(15.8%)hadthehighestchlamydial prevalenceamongthepregnantwomen.Amongnon-pregnantwomen,thehighestoccurrenceratewasfoundamongtheself-employed10(18.5%)closelyfollowed civil servants 4(18.2%)andthen otherswith 4(6.8%).Amongthe women entirely,civilservantshadthehighestrateofchlamydialinfection7(13.2%).

A similar comparison of the study subjects' husbands' occupation revealed that there was nosignificant association between occupation and chlamydial infection. While civil servants hadthe highestprevalence of 12(17.6%) amongthe pregnantwomen,self-employed7(17.5%)hadthehighestprevalencefollowedby civil servants self-employed9(15.0%)amongthenon-pregnantwomen.Thecivilservantshadthehighestoccurrencecase21(16.4%)ofchlamydialinfectionamongbothpregnantandnon-pregnantwomen(Table1).

Perusal of the relationship between level of education and chlamydial infection showed thattherewassignificantassociationbetweenlevelof education andtheinfection amongthewomen. Pregnant women with secondary education 7(12.7%) had the highest rate of infectionfollowedby others with 1(12.5), those with tertiary educationhad6(11.3%) whereas thosewith primary education 0(0.0%) had no chlamydial infection. Also among the non-pregnantwomenothers,thosewithtertiary,secondaryandprimaryeducationhadprevalencesof4(26.7%),6(14.0%),7(11.7%)and1(5.9%)respectively.Therealsowasnosignificantassociation between level of education and chlamydial infection. Overall, others who had noeducation hada prevalence rate of

5(21.7%), those with tertiary educationhad 12(12.5%)followed by secondary education 14(12.2%) whileindividuals with primary educationhadprevalenceof1(2.8%)(Table1).

Table1:DistributionRateofChlamydialInfectionAccordingtoDemographicFactorsamongWomenAttendingClinicsinZariaMetropolis,KadunaState,Nigeria

Riskfactor	No.ofsamples	Pregnant	Non-pregnant	Total

KEY:No.+ve=Numberofpositivesamples;*=Statisticallysignificantassociationexistsatp≤0.05

DISCUSSION

There wasnosignificantassociation of chlamydialinfection with the subjects' occupation.Chlamydial infection was detected in women who were civil servants and self-employed. Asimilar comparison of the study subjects' husbands' occupation revealed that civil servants hadthe highest infection rate among the pregnant women while the self-employed had the highestprevalenceamongthenon-pregnantgroup.Thehighprevalenceamongcivilservantswassurprising as one expects that they should be well informed, enlightened, have a healthy lifestyleso as to protect themselves from sexual health risks and in turn educate others. Hence this alsocalls for a closer attention since they daily interact with people from different works of life. Thereason for the high prevalence among women who are self-employed could also be due to care-freelifestyle,ignoranceandpromiscuityamongthem.

The relationship between level of education and chlamydial infection showed that there was nosignificantassociation.Ithashoweverbeenshownfromthisstudythatthelevelofeducationasa socioeconomic factor has an effect on the study population. The reason for the high prevalenceof CT infection among women with tertiary and secondary school educationmay probably bedue to high sexual activities among such groups. Moreso, since most of the seropositive womenhadsomelevelofeducation,itcantherefore,beexpectedthattheywouldbenefitfromeducational awareness interventions of the disease and in the application of measures to preventit.

CONCLUSION

From this study, the overall prevalence rate of CT was found to be 11.9%. Pregnant and non-pregnant women had prevalence rates of 10.4% and 13.3% respectively.

Chlamydia infection remains largely undiagnosed and a silent disease in apparently healthypopulationsin developingcountries andcan beeradicatedifbehaviou̶ral modifications areimplemented.

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