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The prevalence of Chlamydia infection in the United Kingdom (Uk): A critical review

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Abstract

The global overwhelming prevalence of *Chlamydia trachomatis* may not be unconnected to the asymptomatic nature of the infection. Over 50% of Chlamydia cases can only be detected through diagnosis. Chlamydia is the most diagnosed sexually transmitted infection in the United Kingdom and higher rates of infection are found in women than in men. Over 64% of diagnosed cases of Chlamydia in the UK are among young adults who are between the ages of 16-24 owing to their risky sexual behaviors. Chlamydia is most blame able for urethritis in both men and women. Although there is no currently known vaccine against *Chlamydia trachomatis* however, Chlamydial infection is preventable using condoms and treatable using antibiotics. Various programs and policies such as the National Chlamydia Screening Program NSCP have been inaugurated in the UK to encourage routine screening of all sexually active individuals and those who are particularly at risk. Although, the need to intensify more efforts towards effecting positive behavioral change among individuals with risky sexual behaviour. Also, more screening centres should be instituted at various locations easily accessible to individuals who are vulnerable to Chlamydial infection.

Keywords: *Chlamydia trachomatis*; United Kingdom; Epidemiology; Behavioral Change; Sexually Transmitted Infection

1. Introduction

Chlamydia which causative organism is *Chlamydia trachomatis* [1] is the most prevalent sexually transmitted infection (STI) known in the world, making it a major public health problem [2]. In the UK, Chlamydia is the most diagnosed and treated STI among sexually active men and women [3]. The semen of infected men and vaginal fluids of infected women are the reservoirs of *Chlamydia trachomatis* (4).

One major concern is that, about 70% cases of Chlamydia is asymptomatic and remains unnoticed except through screening [5]. However, *Chlamydia trachomatis* is a contributor to urinary tract infection (UTI) such as non-gonococcal urethritis and post-gonococcal urethritis in men which can assume a more complicated form by causing a chronic pain and swelling in the epididymis of young men [6]. In women, Chlamydial infection is most prevalent and severe [5]. *Chlamydia trachomatis* causes urethritis and cervicitis in women [6]. Infected women may experience a mucopurulent vaginal discharge and even bleeding during and after sexual intercourse [6]. And if not treated, it can result in complications such as pelvic inflammatory disease PID which leads to infertility and ectopic pregnancy [7]

Over the years though inconsistently, highest rate of Chlamydial infection in Europe is usually reported in the UK (ECDC 2009). Hence, this review aims to critically examine the situation of Chlamydia in the UK, its biological, environmental and social determinant as well as identifying the population particularly at risk. Also, current legislation on prevention and control of Chlamydia in the UK will be explored and compared with the one being used in the United States of America (US).

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2. Clinical features of Chlamydia

Chlamydia trachomatis which is gram-negative bacteria exhibits obligate parasitism as it lacks the pathways of carrying out its metabolic and biosynthetic processes and relies on the host cell for metabolic and biosynthetic activities [9]. *Chlamydia trachomatis* undergoes a dimorphic metabolic developmental cycle beginning from the non-reproductive infectious particles known as elementary body (EB) to the intracytoplasmic reproductive form known as reticulate body (RB) [9,10]. Although *Chlamydia trachomatis* is divided into serovars A, B, Ba, C, D, Da, E, F, G, Ga, H, I, Ia, J, K, L1, L2, L2a and L3 according to their distinctiveness in major outer membrane protein (MOMP) but, only Serovars D-K are known to cause the sexually transmitted chlamydial infection, while serovars A-C causes trachoma, and L1-L3 are responsible for lymphogranuloma venereum (LGV) [1]. *Chlamydia trachomatis* has a hemagglutinin which facilitates its attachment to the epithelial cells and produces toxins which inflames the tissue cells [9].

The RB of *Chlamydia trachomatis* is transmitted from infected humans to vulnerable hosts during sexual intercourse [1]. The vaginal and penis of humans are the primary portal of entry of *C. trachomatis* [4]. Nevertheless, *C. trachomatis* can gain entry through the anus during anal sex and through the mouth during oral sex [1].

Sexually active men and women including Men who have Sex with Men (MSM) who indulge in unprotected sexual intercourse are susceptible to Chlamydial infection [1]. Also, women who share sex toys are at risk of contracting the infection [11].

Following transmission of the EB of *Chlamydia trachomatis*, it develops into RB and initiates infection in the host's cell [10]. And after about 20 hour of Chlamydial infection and cell division in the vulnerable host's cell, the RB of the organism develops to the EB and ready to be transmitted to another susceptible host [10].

3. Epidemiology of Chlamydial infection in the UK

The asymptomatic nature of Chlamydial infection has often led to the underestimation of the actual prevalence of the infection [8]. Nevertheless, there has been increasing trends in the diagnosis of Chlamydia in the UK [3].

The genitourinary medicine (GUM) clinics reported a 223% (32288 to 104155) increase in the number of diagnosed cases of Chlamydia between the year 1995 and 2004, and 8.6% (95,879 to 104,155) increase from year 2003 to 2004 [12]. In 2007, highest rate of Chlamydial infection in Europe was reported in the UK, with a total number of 121,986 and a notification rate of 201 per 100,000 populations [8]. The UK was accountable for about 49% of the total number of 253,386 diagnosed cases of Chlamydia reported by all member states of the European Union and European Economic Area /European Free Trade Area [8]. Furthermore, in the UK, the number of diagnosed cases of Chlamydia increased by 7%, from 202,773 in 2008 to 217,570 in 2009 [13]. However, early screening and prompt treatment resulted to a 4% decrease in the reported number of diagnosed Chlamydial cases in England [14]. Highest rates of Chlamydial infection are reported mostly among women as well as young adults who are between the ages 20-24. In the UK about 13% of women compared with 10% of men are infected with Chlamydia (Manavi 2006). Also, highest notification rates of 1,139/100,000 population was observed among women aged 20-24 in the UK compared with the notification rates of 1,026/100,000 population observed among men aged 20-24 in 2004 [12]. Similarly in 2011, women accounted for more than 66% of the total number of about 147,594 reported Chlamydia cases in England among young adults between the ages of 15-25 [14]. The increased rates of Chlamydial cases reports is not necessarily due to high susceptibility and incidence rates but, due to informed policies on Chlamydial screening [8].

4. Preventive measures for Chlamydial infection

Currently, there is no effective vaccine against Chlamydia due to the complexity of the various serovars of *Chlamydia trachomatis* [2]. However, Chlamydia is preventable [16]. Niccolai et al [17] suggested consistent condom use is 87% efficient in preventing against the transmission of *Chlamydia trachomatis* during sexual intercourse, including anal, vaginal and oral sex [18]. Washing shared sex toys or using a new condom after use by another partner is helpful in preventing against Chlamydia transmission [18].

Chlamydia is treatable using antibiotic [19]. An evidence review conducted by Geisler [20] has shown that, azithromycin and doxycycline are very effective in treating Chlamydia. Other useful antibiotics are erythromycin ofloxacin and amoxicillin [19]. However, erythromycin may cause gastrointestinal side effects in pregnant women leading to vomiting [19]. Therefore, azithromycin is highly recommended for pregnant women because, it is more suitable and tolerated with little or no side effects [20].

Owing to the asymptomatic nature of chlamydial infection, screening is effective in preventing the spread of the infection [21]. Furthermore, respective sexual partners of those diagnosed with Chlamydia are notified, screened and treated if they also test positive to the infection [21]. Randomised control trial by Oakeshott *et al.*, (22) has shown that early Chlamydia screening and prompt treatment is effective in preventing PID among women.

4.1 Programmes and policies on Chlamydia prevention in the UK and US

In the UK, there are programmes and policies as well as awareness campaign programmes which measures with the standards used in the United States in controlling and managing Chlamydia [12, 23]

In England, the National Chlamydia Screening Programme (NCSP) was inaugurated by the UK National Screening Committee (NSC) in 2003 with the primary aim of conducting free opportunistic Chlamydia testing for young women under the age of 25 who visits the sexual health clinics for any reason, [24]. Nevertheless, the NCSP also recommends Chlamydia screening for men under the age of 25 [14]. Although, Wales, Scotland and Northern Ireland are yet set up the NCSP but, have published policy documents which address sexual health issues including Chlamydia screening (FPA 2012b). However, free Chlamydia tests and treatment are also available for every age group in the UK at sexual health clinics, GUM clinics, general practitioner (GP) surgery, pharmacies and most contraceptive clinics [26, 27]. Some pharmacies and contraceptive clinics may require fee for these services unless you qualify for free prescriptions [27].

In the UK, under-25 individuals are encouraged to order free Chlamydia testing kits online using the internet in order to carry out self-Chlamydia test in private [26, 27]. Also, free and confidential sexual health counselling, contraception and condoms are provided for under-25 men and women in the UK [26]

Similar to the policy on Chlamydia in the UK, there is a legislation in the US endorsed by the US Preventive Service Task Force (USPSTP) and the Centre for Disease Control (CDC) which recommends that all young women who are aged 24 be annually tested for Chlamydia but, strongly discourages annual Chlamydia screening for those women who are above the age of 24 except their partner has been diagnosed with Chlamydia [28, 29].

The NCSP in England differs from USPSTP in a number of respects because, unlike the NCSP which recommends Chlamydia screening for men and women alike [14], the USPSTP does not recommend Chlamydia screening for men, as they gave that, there was insufficient evidence to show the benefits of this purpose however, the CDC suggests that screening for sexually active men should be considered [30]. Another difference between the NCSP and the USPSTP is that, the USPSTP recommends annual screening for all pregnant women under the age of 24 and those above the age of 24 who are particularly at risk [29] but, the NCSP does not recommend Chlamydia screening for pregnant women because of lack of evidence of its efficacy towards reducing the adverse pregnancy outcomes associated with Chlamydia [31].

5. Discussion

One of the more significant findings of this research is that, highest rates of Chlamydia in the UK are reported among under-25 men and women owing to their high-risk sexual behaviours. Although, various effective policies has been inaugurated towards preventing the transmission of Chlamydia in the UK. However, there is need for Scotland, Wales and Northern Ireland to set up a policy as the NCSP in England specifically for the population particularly at risk in order to curb the high rates of the infection in the regions. Furthermore, efforts should be intensified towards making more screening venues available at strategic locations which is easily accessible to under-25 men and women as they are particularly at risk of Chlamydia in the UK. This will reduce the queues and the lengthened waiting time experienced at GUM clinics. Both the UK and the US policies on managing Chlamydial infection has been effective so far because, the number of individuals who turn up for screening at designated centres has increased and more cases are being diagnosed, reported and treated [12. 23].

Immigration has been repeatedly linked to incidence of STIS [32]. Therefore, the recent surge of immigration of diverse including those from the African and Asian Pacific regions into the UK has instigated the need for rapid sensitization of testing. Situating the GUM centers around ports of entries should be immediately encouraged. Furthermore, a global public health action should be encouraged internationally to establish Chlamydia screening centers where they currently do not exist. This will however mitigate international transmission of the STIs.

6. Conclusion

Unless the adopted chlamydia control policies are laced with health promotion intervention that will effect positive behavioural change, there will not be a significant change in the high-risk sexual behaviour of individuals. This can be achieved using a conceptual framework for behavioural change such as “Health Belief Model” to effect ways in supporting individuals who are vulnerable to Chlamydial infection in adopting given preventive guidelines. Moreover, efforts should be strengthened in notifying partners of individuals diagnosed with Chlamydial infection so that, they can also be screened and treated. This will prevent further spread of the causative organism; *Chlamydia trachomatis*.

Compliance with ethical standards

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Disclosure of conflict of interest

The researcher declares no conflict of interests in this review

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