Investigating factors for increased gonorrhoea re-infection in men who have sex with men attending a genitourinary clinic: a qualitative study

Article (Accepted Version)

Abstract:

Introduction

The number of confirmed cases of gonorrhoea increased by one third in England from 2013 to 2014[1] and incidence increased by 32% in men who have sex with men (MSM)[2]. In our clinic, annual incidence increased by 28.8% (2013) and re-infection (second infection within 1-year of initial infection) rose from 6.7% as a proportion of total infections (2009) to 19.4% (2013).

Aims/objectives

The aim of this study was to explore reasons for repeat gonorrhoea infections among MSM.

Methods:

We interviewed 16 MSM about knowledge and awareness of gonorrhoea, antibiotic resistance and attitudes towards safe sex. We used qualitative methods to investigate the potential causes for the rise in gonorrhoea re-infection.

Results:

Mobile applications were used to meet casual sex partners and arrange impromptu group-sex parties with partner anonymity making contact tracing difficult. The use of recreational drugs was widespread. It was suggested that new technologies could also be used to increase awareness of STI trends and services for at-risk individuals. Participants were concerned about global

antibiotic resistance, but felt that behaviour would not change unless there was local evidence of this. Despite knowing gonorrhoea prevalence was high, participants felt their behaviour was unlikely to change and frequently felt resigned to repeat infections.

Conclusion:

The use of geosocial networking applications to arrange sexual encounters may be contributing to a rise in STIs, as well as recreational drugs, alcohol and sex parties. Networking applications could increase awareness and advertise testing opportunities. In some cases risk-taking behaviours are unlikely to change and for these men regular sexual health screens should be encouraged to detect and treat infections earlier and reduce onward spread.

Introduction

Neisseria gonorrhoeae is the second most common bacterial sexually transmitted infection (STI) in the UK with rising incidence, especially among men who have sex with men (MSM)[2]. It carries significant morbidity and is a risk factor for acquisition and transmission of HIV[3].

In 2014 the prevalence of gonorrhoea in Brighton was 3.2 times the national average[4]. It is estimated that 10% of the population of Brighton self-identify as MSM, with 13.7% of this group being HIV-positive[5]. As Brighton has one of the highest rates of gonorrhoea in the UK there is concern this may contribute to HIV transmission.

A significant proportion of gonorrhoea infections are re-infection (defined as a second infection within one year of initial infection). Repeat audits in our sexual health service show the rate of gonorrhoea re-infection has risen from 6.7% of all gonorrhoea infections in 2009 to 19.4% in 2013[6]. Those with re-infections are almost exclusively MSM (98%) and half of these individuals are HIV positive. Nearly a third of MSM in Brighton who are diagnosed with gonorrhoea re-attend within 12 months with a re-infection and some have several episodes a year[4].

Whilst gonorrhoea is currently treatable, progressive resistance to many antibiotics has developed. Cephalosporin resistance was first reported in Japan (2009), and since then susceptibility and treatment failures have been documented more widely[7]. An outbreak of azithromycin resistant gonorrhoea

was reported in the UK in September 2015[8]. Current guidelines now recommend dual therapy with ceftriaxone and azithromycin to counteract further development of resistance.

To understand these epidemiological changes, it is critical to consider the behavioural issues underlying re-infection. Utilising qualitative methods we aimed to explore this issue to optimise the delivery of health information and potentially develop interventions to prevent primary gonorrhoea infection, and re-infection.

Methods

We conducted a qualitative study using in-depth semi-structured interviews with participants who identified themselves as MSM. Men with a confirmed recent episode of gonorrhoea (within 12 months) and prior infection (within the last 2 years) were identified. Ethical approval was obtained (14/LO/0723, 145856). The inclusion criteria was confirmed rectal, throat or urethral gonorrhoea diagnosed using culture or nucleic acid amplification test (NAAT) on two occasions as outlined above.

Exclusion criteria were anyone under 16 years of age, women and those without sufficient English to be interviewed. We recruited people with and without HIV.

Procedure

Participants were enrolled prospectively as they attended clinic (either the Claude Nicol sexual health clinic or The Lawson Unit for patients attending routine HIV appointments). Participants were given a patient information sheet, after which a researcher explained the study, and obtained informed consent. Participants were offered £20 recompense for their time. Semi-structured interviews were conducted by one interviewer (LP) who had training in qualitative methodology and used a topic guide. The interviews covered the participant's knowledge of safe sex, sexually transmitted infections and gonorrhoea. The topic guide allowed discussion on a priori themes such as antibiotic resistance, identifying risk taking behaviour and included open questions on how participants feel information regarding infections can be disseminated to those who need it.

Data collection was completed until theoretical data saturation was achieved, when no new themes had occurred after several interviews and the same themes continued to be reinforced. Saturation is the gold standard within health science research to determine sample size. In similar qualitative studies on sexual behaviour the majority of themes were identified after 12 interviews[9]. In our study saturation was assessed in parallel as interviews are ongoing to determine whether new themes continued to arise. Interviews were recorded and transcribed verbatim. Transcripts were analysed using content analysis to develop a framework to elicit core themes (both a-priori and emergent). This was done manually by highlighting the text from the transcripts that provided evidence for core themes then these were recorded in Microsoft Excel. Further confirmatory validation was conducted by an independent researcher (DL) who checked each transcript for accuracy of

content. The themes that arose were then discussed and agreed upon. Demographic data were obtained from the electronic patient records.

Results

We interviewed 16 MSM who had gonorrhoea re-infection. . Participant ages ranged from 26 to 53 years (median 36.6), all were white (12 UK, 4 non-UK). All participants were MSM, 14 identified as homosexual and 2 as bisexual. Six were HIV-positive, 10 were HIV-negative (one participant seroconverted during the study). Two participants were taking pre-exposure prophylaxis (PrEP) as part of a research study. Eight themes emerged (Table 1).

1. Oral sex and perceived risk

Condom use for anal sex varied but all participants reported not using condoms for oral sex. An awareness that pharyngeal gonorrhoea could be contracted through receptive oral sex led to apathy and resignation that men could not prevent infection without significant, unachievable behavioural changes. (Table 1 (a))

2. Social networking apps

Participants reported they used mobile applications more often than in the past for meeting casual sexual partners. Participants described having an increased number of new partners per month after using online applications. Participants were attracted to these applications which often guaranteed casual sex and required less personal investment than going out to meet potential partners in bars. A degree of anonymity was maintained and

contacts could be deleted from the device after encounters with minimal personal investment. (Table 1 (b))

3. Sex Parties

Impromptu group-sex parties often facilitated through mobile applications, resulted in some participants reporting more sex, greater numbers of partners, and engaging in higher risk behaviours. Many MSM chose to socialise at parties as alcohol was cheaper than in nightclubs, they could take recreational drugs and engage in sex if they wished. (Table 1 (c))

4. Recreational drugs

The use of recreational drugs or 'chems' was widespread and resulted in unsafe sexual practices. Some participants were concerned for the health of friends who had developed dependence on 'chems' and felt more could be done to help these individuals. Many reported seeing the damaging effects of drugs such as seizures from overdosing on 'G' (γ-butyrolactone/γ-hydroxybutrate) or being alarmed that their peers had started injecting mephedrone. Mephedrone was reported to increase sex-drive and decrease inhibitions whereas G decreased inhibitions and awareness leaving periods of amnesia. These drugs enabled users to initiate sex-acts they may not have the confidence to do whilst sober. Some participants reported medical complications such as abscesses at injection sites, as well as debts due to their drug habits. (Table 1 (d))

5. Antibiotic Resistance

Knowledge of increasing antibiotic resistance varied but most participants felt that this risk was worrying, particularly if treatment for resistant gonorrhoea resulted in hospital admission for intravenous antibiotics. Some felt if more people were aware of this, subsequent fear might impact on behaviour. (Table 1 (e))

6. Complacency regarding HIV treatment

Many participants were either living with HIV or knew people who were HIV-positive and were aware that HIV is no longer a terminal condition. There is a lack of fear regarding HIV in younger participants and some suggested this has led to complacency with condoms. (Table 1 (f))

7. Seroadaptive behaviour

Some HIV-positive participants reported they were more likely to engage in unsafe sex since their diagnosis. They would specifically choose partners who were also HIV-positive to avoid the anxiety of transmitting the virus when engaging in unprotected or 'bareback' sex. Some sex parties were specifically 'pos-parties' where only those with HIV were encouraged to attend and where condom use was rare. (Table 1 (g))

8. Using Geosocial applications to disseminate public health information

Several participants felt applications could be used to inform people of an increased risk of STIs and encourage regular testing. Posters and leaflets were out-of-date and participants felt embarrassed reading them in public. 'Pop-ups' on applications could privately reach those engaging in high-risk sex with multiple casual partners. Participants said they felt comfortable discussing their concerns with advocacy or sexual health professionals online. (Table 1 (h))

	Themes Identified	Table 1. Quotes from participants on themes identified (Participant age in brackets)
1	**(a) Oral sex and perceived risk**	"*Like I say, condoms for oral sex are just inconceivable to me, what's the point?" Participant 2, (40)* *"Apart from not having as much oral sex I don't know how I can lower my risk because I'm not gonna put a condom on for you. Because I've always had it in my throat so it's always me giving oral sex." Participant 15, (26)*
2	**(b) Social networking apps**	*"You want to see when Grindr really became there, this is where your problem is and that's my definite hypothesis. Grindr is what is causing this to go up" Participant 12 (43)* *"That's like you go for Grindr it's, I can't explain the best way. It's anonymity for a start, it's on your phone and if you* install an app *and all those things when you add them all together instant gratification, which you can have without anybody knowing." Part*icipant 14 (36)
3	**(c) Sex Parties**	*"There are notorious house parties that have been going on, that I've heard about. I've been to a few myself. I've never really joined in myself but I know there's like 30 people in a house and everybody is having sex with each other every other weekend'* Participant 7,(28) *"The sex may have changed so it may be the sex parties rather* then one guy or two guys hosting it could be an all weekender that *started on Thursday night and they will finish on Sunday afternoon and there's a revolving door and it just keeps coming. Yo*u could probably have just from one sex party and then over the course of that weekend you could probably have a hundred infections by *the end of the weekend." Participant 9 (37)*
4	**(d) Chem drugs**	*"When I first started going out in Manchester and started exploring drugs and everything it was kind of ecstasy, mainly ecs*tasy to start with then you know coke maybe some ketamine, speed and then now its like GHB, GBL, mephedrone, its just everywhere and *then I've never come across crystal meth until I moved to Brighton……...not just the smoking but the injecting as well. For* a small *town by the sea it's quite surprising but I know now it's a big influence on peoples sexual behaviour" Participant 11, (30)* *"I don't think I've ever met up with someone that hasn't talked about drugs or got drugs or is taking drugs. When you mee*t up *casually for sex and I think it plays a massive, massive part."* Participant 4, (43) *"Have you heard of slamming? And you stick it in your arm and I've started doing that. I know. I've stopped it now. Sorry* I started doing it in Brighton, I thought *'oh this is quite nice, actually this is too nice'. And then I thought, I better put an end to that. I did quite*

		a lot of damage to myself. I ended up having an abscess in my arm. I had to have an operation to take it out." Participant 14, (36)
5	**(e) Antibiotic Resistance**	*"Actually, to be quite honest, it would take me going in to hospital and having to have a course of hospital antibiotics for* gonorrhoea, *that would be the wake up call. Being told that the risk is there, ok?" Participant 2, 40* *"*My biggest worry about the frequency of which I am here with a suspected gonorrhoea infection is that I am becoming resistant to it. Erm, I must have had it 20 times. I have been coming here 20 years so th*at's an average of once a year"* Participant 9, (37)
6	**(f) Complacency regarding HIV treatment**	*"I think this has become easier now because of the medicine. Because it is not a death sentence anymore so there is no panic*. And my friend he is 40 years old right and he has gone through the whole epidemic, the AIDS epidemic in London right and he said *he will not engage with anybody unless with a condom right. And because I am living in a generation that we don't talk much* about *it anymore that much because we have a pill and there is no more panic…..Because when you are in London in the 80's, in the 80's* there was the pandemic, you see people dying all the time so you kind of get this imprinted on your memory. I was born in th*e 80's so I haven't seen it. Participant 16 (29) "* *"I think we need a big, campaign like we did in the 80's to shock people because the message is not getting through and the* younger generation because of all the different combination therapies you can have now and PEP they think they can get away with *it. They think oh that's fine I can have unprotected sex and I can take a pill for it tomorrow and that's not the case as you and I know" Participant 10, (45)*
7	**(g) Seroadaptive behaviour**	*"Everyone thinks and feels the same way that I do. That they would rather have bareback and* if we are gonna have bareback sex *we don't want to have the responsibility for creating another headache for the NHS" Participant 14, (36)* *"The point is between positive person having sex its more liberal. It's much more liberal. You don't think about* anything even if there is still the hepatitis C problem to think about. I would say like I told you, before I was positive I was having safe sex with *basically 80% of guys now it's like 10%. It's changed my way of having sex." Participant 8, (30)*
8	**h) Using Geosocial applications for public health**	*"I think in a way you need to communicate with people through the sort of media that they are using. So you almost need to g*o to the apps and to the sites that are used to facilitate these connections and ad*vertise on that." Participant 13, (47)* *"Different people will be respond to different forms of marketing. You will get people that respond to invites on facebook o*r sponsored things on facebook. You may get people who respond to twitter. Use soci*al media for your advantage"* Participant 9, (37)

Discussion:

This study showed participants had considerable knowledge gaps regarding gonorrhoea infection. Before they acquired the infection many were unaware of the increased prevalence of gonorrhoea and of increasing antibiotic resistance.

A key emerging issue amongst this population is the stated increased use of geospatial mobile applications to facilitate meeting for casual sex. When combined with a reported increase in the use of dis-inhibitory drugs, subsequent sexual behaviour or 'chemsex' could be contributing to the increasing incidence of gonorrhoea infection and re-infection. With a focus on maintaining anonymity and pursuing pleasure these practices are gaining increased cultural acceptability, in spite of clear individual awareness of the risks. [10,11]

Anonymity, or not sharing personal information with sexual contacts, seemed to be beneficial for our participants in that intimate encounters had minimal impact on subsequent day to day life. This provided an element of fantasy where participants could engage in hypersexual behavior without fear of any consequences. This compares to previous decades where anonymity may have been sought to avoid stigma from society associated with HIV or sexual preference.

For those living with HIV, who are often knowledgeable about transmission, there was a psychological separation between HIV and other STIs.

Seroadaptive behaviours such as ‘pos-parties’ may reduce HIV transmission, but this is at the cost of other safe sex behaviours which prevent STIs[12].

This study comes at a key time when the incidence of bacterial STIs is increasing and the threat of antibiotic resistance is rising. Although the themes highlighted in our study are frequently seen by health professionals working in sexual health, there are no previous qualitative studies looking specifically at attitudes of MSM towards gonorrhoea and antibiotic resistance. As this is a qualitative study, it is important to note results are not based on statistical tests or numerical values. The interviews were analysed with a content analysis to identify recurrent themes which informed our conclusions.

Although our participants were diverse, including participants taking PrEP, our study did not differentiate between those who had recurrent oral infection and those with urethral or anal gonorrhoea. This could have led to a degree of bias in those who acquired gonorrhoea from oral sex only and had otherwise adopted safe sex practices as around 33% of gonorrhoea is transmitted from unsafe oral sex.[13] The majority of individuals approached for this study agreed to participate but two, who had more chaotic lifestyles and repeat infections, did not attend clinic or declined to participate.

Some participants reported that unless they experienced resistant infection first-hand they would not change behaviour and practice safe sex. Condom use for oral sex was felt to be universally unachievable and has led to participants feeling resigned to recurrent infections. For these men, risk-

taking behaviours are unlikely to change and regular STI screens should be encouraged to reduce onward transmission.

MSM have specific healthcare needs. It is essential to engage effectively with this group to understand changes in risk-taking behaviour and the impact these may have on rates of STIs. Participants were aware their individual, repeat infections were indicative of a much larger problem. Bacterial STI re-infection is particularly important due to it's effect on HIV transmission. In spite of advances in knowledge of HIV treatment and prevention, and awareness of increasing STI rates at a regional and national level, the harmful effects of repeated bacterial infection for the individual are often not emphasised enough.

Geo-social networking applications used by MSM to arrange sex could be harnessed to disseminate public health information and advertise local testing opportunities.

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