Evaluation of a screening programme for chlamydia and gonorrhoea in HIV-infected men who have sex with men

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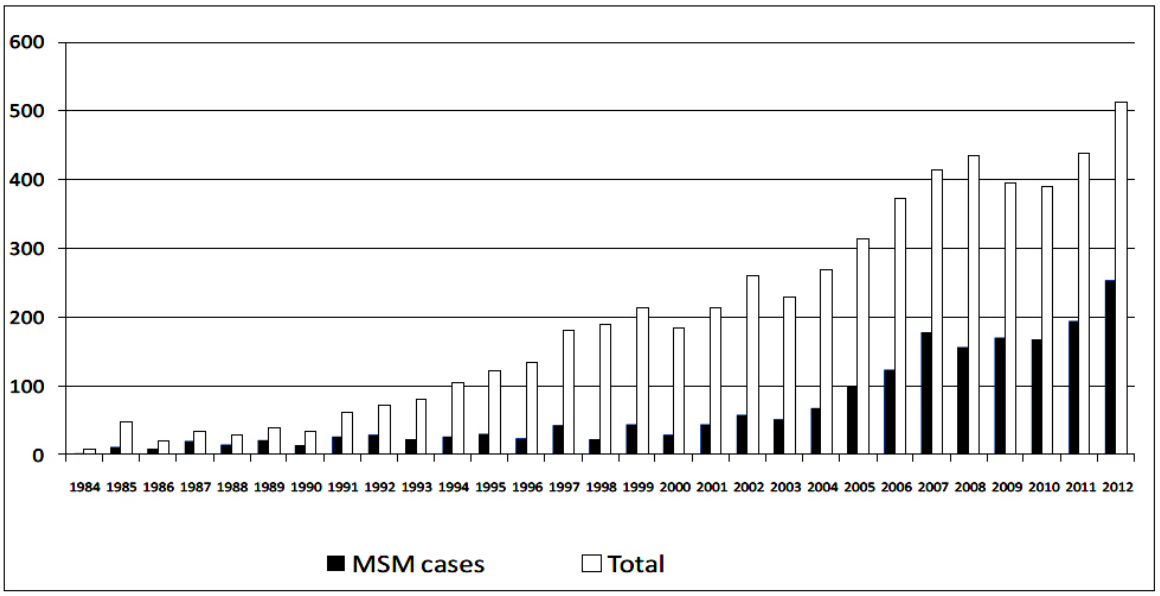
Background

Chlamydia (CT) and gonorrhoea (GC) infections are common and increase HIV transmission. Following a world-wide trend, men who have sex with men (MSM) are most affected by HIV in Hong Kong and many of them acquire the infection locally. Screening for asymptomatic CT and GC among HIV-infected MSM is recommended by guidelines to improve their sexual health and prevent transmission of CT/GC and HIV. However, overseas studies indicated that uptake of screening may be poor in HIV-infected MSM despite a higher rate of STI than the uninfected or of unknown status[1,2].

Figure 1. Reported HIV infection in Hong Kong, 1984 – 2012



Objective

To evaluate the effectiveness and efficiency of a clinic-based screening programme for CT and GC in HIV-infected MSM

Methods

Systematic evaluation of the CT/GC screening programme for MSM in a HIV clinic between 2008 and 2011 was conducted. The Donabedian framework was used to summarise the relevant standards. Indicators are largely derived from UK National Chlamydia Screening Programme Standard (6th Edition) and UK National Guideline for Gonorrhoea Testing 2012. A model used by Farley et al. was adopted for deriving the number of HIV infections prevented by the screening programme. All parameters in the original model except a smaller number of daily unprotected sex acts (0.04) as reported by CT/GC-infected MSM in ITC and updated estimation of per act probability of unprotected anal sex (0.005) by US CDC were applied[3]. Microsoft Excel was used for the calculation.

Table 1. Framework for evaluation – Structure

Area of evaluation	Indicator
Service delivery	Documented policy and pathway for screening and subsequent management
Laboratory testing	● Validated NAAT with positive predictive value exceeding 90% ● Laboratory should be appropriately accredited
Data collection and information system	● Quality assurance and security of testing activity dataset
Engaging patients and providers	Educating patients and training providers

Table 2. Framework for evaluation – Process

Area of evaluation	Indicator
Offering the test	● Testing rate by subgroups of HIV-infected MSM, at baseline and annually afterward
Providing results	● >90% of those tested positive notified of results within 10 working days from date of test
Management of positives	● Provide risk reduction counseling and discuss partner notification ● >95% positive patients treated according to clinical guidelines within six weeks from the date of test ● Reinfection rates of CT and GC
Notifying the partner	>0.4 sex partner notified per index case who were verified by healthcare staff in ITC and/or the index case as having been tested and/or treated within four weeks of partner notification discussion

Table 3. Framework for evaluation - Outcome

Area of evaluation	Indicator
Preventing STI and HIV transmission	● Prevalence and incidence rate of CT and GC ● Number of HIV infections averted

Results

The overall screening rate of all HIV-infected MSM at risk of CT/GC was 80% (95% CI: 79% to 82%). All except one infected patients completed treatment, with 88% (95% CI: 78% to 93%) within 6 weeks from testing. The prevalence of CT/GC decreased by 0.9% (95% CI: -0.9% to 3.1%), and the incidence rate decreased by 1.5 episodes per 100 person-years (95% CI: -0.6 to 3.5) during the assessment period. Among those completed treatment for asymptomatic CT/GC, the estimated number of HIV infections averted was 6.5. The cost of the screening programme in preventing one HIV infection was HKD154 826, in comparison to HKD110 000 for the annual cost of lifelong antiretroviral treatment for one patient alone in 2011.

Table 4. Results of the screening programme

Year	No. of test	CT				GC			
		No. positive	Prevalence (%)	95% CI	PPV* (%)	No. positive	Prevalence (%)	95% CI	PPV* (%)
2008	501	17	3.4	2.1 – 5.4	87.4	2	0.4	0.1 – 1.4	100
2009	567	18	3.0	2.0 – 5.0	85.9	2	0.5	0.1 – 1.3	100
2010	627	16	2.6	1.6 – 4.1	84.0	1	0.2	0 – 0.9	100
2011	734	18	2.5	1.6 – 3.8	83.4	0	0	0 – 0.5	-

Discussion

This area of clinical practice is governed by a variety of standards. Based on the evaluation criteria assessed, the urine screening programme at ITC had a clear care pathway and robust information system. Regarding laboratory testing, UK guidelines recommended that confirmatory test by another NAAT using a different nucleic acid target is necessary when PPV fell below 90%, as found in this case.

94% of new patients and 66% of existing patients had urine screening at least yearly, which compares favourably with similar programmes in US (14%-33%) and Australia (18%-47%)[2,4-5]. Some 16% to 23% sexually inactive patients were screened each year, but only one had positive test. To improve the efficiency of the programme, screening should be prioritized for those who are sexually active and at risk of CT/GC infections.

Among 64 positive cases which have relevant information, 71% to 100% of them were notified within 10 working days from test date. The same standard was met by 84% of primary care trusts participating in UK National Chlamydia Screening Programme in 2010[6]. Increasingly more positive patients were treated within 6 weeks from the test date (76% - 100%). A local paper revealed that 30.3% of GC strains tested in 2010 were not susceptible to azithromycin. Subsequently, intramuscular ceftriaxone has been added as part of the treatment in ITC.

The successful rate of notifying the partner of CT/GC infected patients was suboptimal, ranged between 0.1 to 0.4. In comparison, 35% of programme areas in urban settings of the UK National Chlamydia Screening Programme met the standard of 0.4 partners notified per index case in 2009.

There is a falling trend of the annual prevalence of CT and GC from 3.4% to 2.5% and from 0.4% to 0% respectively among patients screened, but not reaching statistical significance. The rates were low when compared with similar overseas programmes among HIV-infected MSM[2,4-5]. Nonetheless, mathematical modelling showed that screening of CT and GC urethritis in an US HIV clinic was beneficial in averting HIV infection with prevalence as low as 0.5%[3].

Sensitivity analysis of estimated HIV infections averted was performed by varying HIV prevalence in partners, duration of STI infection, STI and per act probability of HIV transmission. The estimated number of HIV cases averted ranged from 0.1 to 38.5. Per act risk was the most important factor, and is affected by HIV viral load and mode of unprotected sexual exposures.

Conclusion

The screening programme effectively diagnosed asymptomatic CT/GC infections for treatment and reduced HIV transmission in HIV-infected MSM at a reasonable cost.

Reference

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