



Kissing but not sex is the strongest risk factor for oropharyngeal gonorrhoea in men who have sex with men: a cross-sectional survey

Eric P.F. Chow^{1,2}, David Priest¹, Jane S Hocking³, Deborah A Williamson^{4, 5}, Vincent J Cornelisse^{1,2}, Tim R.H. Read^{1,2}, Catriona S Bradshaw^{1,2}, Marcus Y Chen^{1,2}, Christopher K Fairley^{1,2}

- Melbourne Sexual Health Centre, Alfred Health, Carlton, VIC, Australia
- Central Clinical School, Monash University, Melbourne, VIC, Australia
- Centre for Epidemiology and Biostatistics, Melbourne School of Population and Global Health, The University of Melbourne, Melbourne, Victoria, Australia
- Microbiological Diagnostic Unit Public Health Laboratory, Department of Microbiology & Immunology, The University of Melbourne at The Doherty Institute for Infection and Immunity, Melbourne, VIC, Australia
- Doherty Applied Microbial Genomics, Department of Microbiology & Immunology, The University of Melbourne at The Doherty Institute for Infection and Immunity, Melbourne, VIC, Australia



BACKGROUND

- The oropharynx is a common site of gonorrhoea among men who have sex with men (MSM).
- A mathematical model has supported the hypothesis that transmission from oropharynx to oropharynx (i.e. kissing) is sustaining the gonorrhoea epidemic among men who have sex with men (MSM)¹. However, no empirical data have confirmed this.
- Previous studies examining the association between kissing and oropharyngeal gonorrhoea did not examine kissing outside sexual practice.

AIM

- To determine whether kissing-only is a risk factor for oropharyngeal gonorrhoea in MSM.



Table 2. Risk factors associated with oropharyngeal gonorrhoea positivity among men who have sex with men.

Risk factors	Number of individuals	Crude OR (95% CI)	Adjusted OR (95% CI)
Number of kissing-only partners			
0-1	1,724	1	1
2-3	747	1.32 (0.91-1.93)	1.36 (0.89-2.10)
≥4	1,298	1.99 (1.48-2.68)	1.59 (1.10-2.31)
Number of sex-only partners			
0-1	2,867	1	1
2-3	506	1.33 (0.92-1.92)	1.25 (0.83-1.88)
≥4	396	1.44 (0.97-2.14)	1.04 (0.66-1.64)
Number of kissing-and-sex partners			
0-1	937	1	1
2-3	1,246	1.29 (0.85-1.96)	1.06 (0.67-1.70)
≥4	1,586	2.24 (1.54-3.25)	1.52 (0.97-2.39)
Age			
16-25	1,037	2.09 (1.20-3.62)	1.78 (0.96-3.27)
26-35	1,640	2.04 (1.20-3.48)	1.97 (1.10-3.52)
36-45	624	1.79 (0.99-3.25)	1.49 (0.78-2.86)
≥46	468	1	1
HIV status			
Negative	3,670	1	1
Positive	99	2.14 (1.15-3.96)	1.56 (0.75-3.25)
Known gonorrhoea contact			
No	3,627	1	1
Yes	142	5.39 (3.57-8.13)	3.82 (2.37-6.16)
Urethral gonorrhoea			
Negative	2,900	1	1
Positive	59	11.52 (7.47-17.76)	2.47 (1.42-4.29)
Not tested	576	0.84 (0.56-1.27)	1.09 (0.71-1.67)
Anorectal gonorrhoea			
Negative	3,142	1	1
Positive	114	19.38 (13.93-26.96)	12.58 (8.51-18.58)
Not tested	279	1.90 (1.18-3.06)	2.08 (1.27-3.40)

METHODS

- A cross-sectional study was conducted at the Melbourne Sexual Health Centre (MSHC), Australia, between March 2016 and February 2017.
- MSM attended MSHC were invited to complete a short questionnaire using computer-assisted self-interview (CASI).
- This short questionnaire collected data on the number of partners of the following activities in the last 3 months
 - Kissing-only (i.e. kissing without oral and/or anal sex);
 - Sex-only (i.e. oral and/or anal sex without kissing);
 - Kissing-and-sex (i.e. kissing with oral and/or anal sex) partners in the last 3 months.
- Responses to the questionnaire were linked to the test result of oropharyngeal gonorrhoea by nucleic acid amplification test.
- Potential confounders such as demographic characteristics, HIV status, known gonorrhoea contact and gonorrhoea infection at the urethra and anorectum were adjusted in the model.

Table 1. Mean and median number of partners for kissing-only, sex-only and kissing-and-sex partners among men who have sex with men.

Type of activities	Mean number of partner (standard deviation)	Median number of partner (interquartile range)
Kissing-only	4.2 (8.6)	2 (0-5)
Sex-only	1.4 (4.2)	0 (0-1)
Kissing-and-sex	4.9 (8.8)	3 (2-5)

RESULTS

- 3,769 men completed the survey and were tested for oropharyngeal gonorrhoea. The median age was 30 (IQR 25-37).
- The oropharyngeal gonorrhoea positivity was 6.2% (234/3769).
- Table 1 shows the number of partners for kissing-only; sex-only; and kissing-and-sex. Kissing is common during sex and the majority (62.5%) of MSM did not have sex-only partners.
- Table 2 shows that reporting ≥4 kissing-only partners (aOR=1.6; 95% CI: 1.1-2.3) was significantly associated with oropharyngeal gonorrhoea compared to men who had one or less kissing-only partners after adjusting for potential confounding factors.
- Number of sex-only partners (p=0.567) was not associated with oropharyngeal gonorrhoea.
- Reporting ≥4 kissing-and-sex partners was associated with oropharyngeal gonorrhoea in the univariable analysis (aOR=2.3; 95% CI: 1.54-3.25) but was not significant in the adjusted analysis (aOR=1.52; 95% CI: 0.97-2.39).

CONCLUSIONS

- MSM have a similar number of kissing-only partners and kissing-and-sex partners. Very few MSM had sex-only partners.
- Kissing-only is the strongest risk factor for oropharyngeal gonorrhoea in MSM.
- Our data suggest that sex is not the principle acts responsible for oropharyngeal gonorrhoea and that and that the borderline significance of kissing and sex is a risk primarily associated with kissing.
- Majority of MSM do not use condom for oral sex. A non-condom based intervention that targeting the oropharynx is required to prevent and control the spread of oropharyngeal gonorrhoea.

REFERENCE

- Zhang L, et al. *Neisseria gonorrhoeae* Transmission Among Men Who Have Sex With Men: An Anatomical Site-Specific Mathematical Model Evaluating the Potential Preventive Impact of Mouthwash. Sexually Transmitted Diseases. 2017; 44(10): 586-592.

CONTACT

Dr Eric Chow, Senior Research Fellow
E: echow@mshc.org.au | T: +61 (3) 9341 6233