Event-specific risk factors predicting unprotected anal intercourse among Hong Kong men who have sex with men: a case-crossover study

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KEY MESSAGES

1. Availability and possession of condoms, condom negotiation, and planning to use condoms were event-specific factors related to lower likelihoods of unprotected anal intercourse (UAI) with both regular and non-regular male sex partners (RP and NRP). Situational risk factors for UAI were anal sex taking place during the weekday and tiredness prior to anal sex. Other situational and environmental factors were display of reminders promoting condom use, home settings, travel, and nervous feelings.
2. HIV prevention should consider the aforementioned factors and target specifically on inconsistent condom users. It should therefore be based on research discriminating between episodes of UAI and protected anal intercourse (PAI) within inconsistent condom users, rather than those obtained from traditional studies discriminating between consistent and inconsistent condom users. This is especially important as our findings suggested that the factors derived by the two types of studies might differ.
3. HIV prevention should consider segmentation of RP and NRP, as predictors of UAI differ among the two partner types.
4. This study demonstrates the usefulness of a case-crossover design for investigating event-specific variations in behaviours.

Hong Kong Med J 2016;22(Suppl 7):S41-2
RFCID project number: 09080032

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In 2008, the HIV prevalence was 4.3% among men who have sex with men (MSM) in Hong Kong.[1] The prevalence of unprotected anal intercourse (UAI) among MSM in Hong Kong ranged from 25% to 67%.[1,2] According to the socio-ecological model[3] advocated by HIV workers, factors associated with UAI exist at individual, interpersonal, and environment levels. Most associated factors are derived from cross-sectional surveys that discriminate between consistent and inconsistent condom users among MSM, but this cannot explain why an individual uses condoms inconsistently. According to the social learning theory,[4] event-specific factors are predictive of health-related behaviours.

The case-crossover design is developed to identify event-specific (episode-specific) variables that are predictive of health outcomes.[5] It has been increasingly used in different research areas. Nonetheless, only two studies applied the design to investigate factors associated with HIV-related behaviours among MSM, but these studies focused on a narrow range of situational risk factors. The present study applied this study design to investigate whether three types of event-specific factors (sex partners' attributes, situational factors, and environmental/settings factors) are predictive of episodes of UAI among MSM in Hong Kong who were inconsistent condom users.

Factors with regard to two contrasting events—an episode of UAI versus an episode of protected anal intercourse (PAI) of the same person—was compared.[5] A total of 428 MSM who had at least one episode each of UAI and PAI with a man in the previous 6 months were recruited; respectively 213 and 215 MSM involved regular and non-regular sex partners (RP and NRP) and completed the questionnaire.

A higher likelihood of UAI with RP was associated with alcohol use by the participants or the partner prior to sex, having the participant suggested UAI, the anal episode took place overseas, during a weekday, and not at home. Whereas a lower likelihood of UAI with RP was associated with planning and discussion about condom use, perceived partner's preference for condom use, suggestion to have PAI by the participant or the partner, condoms already placed at the venue, and the partner possessed a condom.

A higher likelihood of UAI with NRP was associated with feeling tired or nervous before having anal sex, perception that the partner was

unlikely use condoms, having the participant or partner suggested UAI, and the anal sex episode took place on a weekday. Whereas a lower likelihood of UAI with NRP was associated with partner of age ≤35 or unknown age, having had at least three times of anal sex with the NRP, perception that himself and the NRP had had asymmetrical sexual experience, perception that the NRP was feminine, and liking towards the NRP, as well as having had UAI with another men in the last week, discussion about condom use prior to anal sex, perceived partner's liking in condom use, the participants or partner's suggestion to have PAI, planning to use condoms, condoms already placed at the venue, display of condom use promotion materials, and the participant or partner possessed a condom.

Almost all factors related to condom negotiation and the perception that the partner liked to use condoms were protective factors against UAI with both RP and NRP. The protective effects of the availability of condoms are also evident. HIV prevention targeting inconsistent condom users should cultivate skills and rehearsals about speaking out the wish to use a condom and insisting on condom use. Venues such as gay saunas and hotels should ensure accessibility of condoms, and inconsistent condom users may put up reminders as their tailor-made cue to actions for PAI. Non-structural situational factors (eg sex taking place during a weekday, overseas, not at a home setting, tiredness and nervous feelings prior to anal sex) also trigger off UAI. MSM should be trained on how to relax and improve self-efficacy on condom use when such situations arise. Our findings provide important insights for designing new HIV prevention. A critical review of the appropriateness of relying only on the factors obtained from conventional studies that discriminate between consistent and inconsistent condom users is warranted.

Acknowledgements

The study was supported by the Research Fund for the Control of Infectious Diseases, Food and Health Bureau, Hong Kong SAR Government (#09080032).

The research team would like to thank all participants and those who helped in data collection.

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