PARTNER NOTIFICATION OUTCOMES AMONG MALE GONORRHEA PATIENTS AT BANGRAK HOSPITAL, BANGKOK, THAILAND

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Abstract. Partner notification (PN) is an important strategy to control sexually transmitted infections. The objective of this study was to assess the outcomes of PN in order to improve control of sexually transmitted infections. We retrospectively reviewed heterosexual male gonorrhea cases who presented for treatment to Bangrak Hospital during 2008 to determine the percent PN, the percent of successful partner management (SPM) and the factors associated with both. We used univariate and multivariate analyses to determine significant associations between characteristics of index cases and PN outcomes. We reviewed the medical records of 418 index cases. The median age of the subjects reviewed was 30 years old (range: 14-63). Six hundred ninety-two partners were identified. Of those, 367 partners (53.0%) were notified by 311 index cases; 95 partners (25.9% of the notifications) of the 89 index cases presented for treatment. The medical records of 92 partners were available to review: 61 (66%) had gonorrhea, chlamydia, or genital herpes infections. The median period from being notified to seeking care was 2.5 days (range: 0-92); 80% sought care within 9 days of notification. Spouses and girlfriends were the major partners being notified and had greater SPM. On multivariate analysis, a greater notification rate was found among index cases who were government workers or had a steady relationship. A higher SPM rate was associated with index cases who were aged ≥25 years, married or had a steady relationship. The PN rate among the studied index cases was inadequate. Further studies are needed to develop successful methods to improve PN rates and SPM rates in order to improve sexually transmitted infection control in the study population.

Keywords: sexually transmitted infection, gonorrhea, partner notification, partner management, Thailand

INTRODUCTION

Sexually transmitted infections (STIs) are important global public health problems and can facilitate the transmission of HIV. The World Health Organization (WHO) estimates there are 357 million new cases of chlamydia, gonorrhea, syphi-

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lis and trichomoniasis per year worldwide and the prevalence is rising in some countries (WHO, 2015).

Partner notification (PN) is an important control and prevention strategy (CDC, 2015). With PN sexual partners of the patient are informed that they may have been exposed to an STI and need to seek treatment. PN helps to identify STI so they can be treated prior retransmission (Ferreira *et al*, 2013). However, PN is estimated to occur in 48-79% of STI cases and only 30-60% are estimated to seek treatment (Hogben and Kissinger, 2008).

PN is a part of the STI control program in Thailand. PN approaches include patients informing their sex partners (patient referral method) and STI service providers informing their sexual contacts (provider referral method). The main objective is to ensure the partners undergo investigation and treatment. In cases where the partner is unable to seek STI care, the patient may deliver antibiotics to the partner (patient delivered partner therapy, PDPT). In 2002, health care changes occurred in Thailand, resulting in closures of the majority of STI clinics. As a result, STI morbidity increased and the 5-year successful partner management (SPM) (1998-2002) percentage decreased from 67.2% to 56.5% (2003-2007) (STI Cluster, 2008). Therefore, it is necessary to monitor outcomes of PN regarding STIs in order to strengthen and achieve better STI control.

The objectives of this study were to determine the percent PN among heterosexual male gonorrhea patients and the outcomes of those cases.

MATERIALS AND METHODS

Study population

We conducted this retrospective study at Bangrak Hospital, the national reference STI hospital for Thailand. All medical records for heterosexual males diagnosed with gonorrhea attending the clinic during the fiscal year 2008 (October 2007 - September 2008) were included in the study.

Data collection

The gonorrhea (index) cases were identified from the STI log book in the out-patient department. The medical and PN records for all the index cases and their partners who presented for treatment were reviewed. Information recorded included the number of partners identified, investigated and treated and the sexual practices of the index cases and their partners.

An index case was defined as a new case of gonorrhea in a heterosexual male, diagnosed by Gram stain or culture. A partner was a person who had sex with the index case within the 60 days prior to the index case having symptoms of or being diagnosed with gonorrhea. The diagnosis and treatment of gonorrhea at Bangrak Hospital follows Thai national guidelines for STI treatment. All gonorrhea cases were interviewed, counseled regarding safer sexual practices and instructed to notify their sexual partners. Cases were given referral slips for their contacts to attend a STI clinic. Cases whose contacts were unable to attend a STI clinic were given medications for PDPT. For contacts who were sex workers (SW), the referral slips were sent to the STI division, Bureau of Health, Bangkok Metropolitan Administration for health providers to perform the notifications and the results were sent back to Bangrak Hospital. For contacts who presented for treatment, their referral slips were collected and sent to the PN counselor.

Data analysis

Data were entered into and analyzed using Microsoft Office Excel and Epi Info™. Means and standard deviations or medians and ranges were calculated for measured data where appropriate. Frequencies and percentages were used to describe categorical variables. The associations among variables were analyzed using univariate analysis or chi-square. Risk ratios (RR) and odds ratios (OR) were calculated with 95% confidence intervals. A *p*-value <0.05 was considered statistically significant.

To determine the relationship between index case characteristics and PN/SPM, various characteristics were categorized into 2 groups. Gonorrhea types were divided into uncomplicated and others; age groups were divided into those aged <25 years and ≥25 years; marital status into those married and others; place of living into Bangkok and others; education level into bachelor degree and others; occupation into government workers and others; monthly income into ≤10,000 Baht/month and >10,000 Baht/month; number of sexual partners into multiple partners and a singer partner; and type of partners into spouses or girlfriends and casual partners or SW. Variables with a *p*-value <0.05 on univariate analysis were included in multivariate logistic regression analysis.

RESULTS

There were 418 cases during the study period; 97.4% were cases of uncomplicated gonorrhea. The median age of the cases was 30 years (range 14-63). The majority of cases (84.5%) lived in Bangkok. Two hundred sixteen cases (51.7%) were single and 158 (37.8%) were married; 176 cases (42.1%) had a secondary school education level. Labor was the most common occupation (57.7%), followed by student (13.9%). Forty-two point one percent of subjects had a monthly income of 5,001-10,000 Baht/month. Forty-eight point eight percent of cases had multiple sexual partners. Only 30.6% reported consistent condom use. Condom breakage occurred in 28.3%. The most common occasion for condom use was while having sex with a SW (63.4%) and the next was with a casual partner (27.9%). Condom breakage occurred more often with SW (26.8%) and casual partners (28.1%). More cases were in the ≥ 25 year old age group (67.9%) than in the <25 year old age group (32.1%).

Of 418 cases, 311 (74.4%) notified their partners; 302 used contact slips and 9 used PDPT. Partners of 89 index cases (89/311, 28.6%) presented to Bangrak Hospital for treatment (Table 1).

There were 692 reported partners among the 418 cases giving an average of 1.66 partners per index case. Among 692 partners, 367 partners (53.0%) had sufficient information to initiate PN. Contact slips were provided for 358 partners and PDPT for 9. Ninety-five of 367 partners (25.9%) presented for STI evaluation and management at Bangrak Hospital (Table 2).

Of the 95 partners who presented for treatment, medical records were available for 92 (97%). The median age was 26 years (range: 15-51). The majority of them (66%) lived in Bangkok and were married (79%), had a secondary school level education (35%), were laborers (50%) or housewives (29%). Fifty-nine percent of partners worked and 34% of them earned 5,000-10,000 Baht/month. Eighty-four partners (91%) who presented for treatment were spouses or girlfriends, 7 (7.6%) were casual partners and one was a SW. The

Table 1
Outcomes among the 418 index cases.

	No. (%)
Total cases who notified partners (*N*=418)	311 (74.4)
By contact slips	302 (72.3)
By PDPT	9 (2.2)
Outcomes of cases who notified partners (*n*=311)	
At least 1 partner presented for STI care	89 (28.6)

Table 2
Outcomes of the 692 reported partners.

	No. (%)
Total partners notified (*N*=692)	367 (53.0)
By contact slip	358 (51.7)
By PDPT	9 (1.3)
Outcomes of partner notified (*n*=367)	
Partners who presented for STI care	95 (25.9)
Partners who received treatment via PDPT	9 (2.4)
Total partners treated	104 (28.3)

Table 3
Factors associated with PN by multivariate analysis.

Patient characteristics	Crude RR	95% CI	Adjusted OR	95% CI	*p*-value
Married	1.32	1.17-1.47	1.47	0.79-2.74	0.223
Multiple partners	1.23	1.09-1.38	1.12	0.65-1.94	0.675
Government worker	1.23	1.14-1.45	5.25	1.11-24.81	0.036
Spouse or girlfriend	2.18	1.73-2.75	8.37	4.76-14.71	<0.001

Table 4
Factors associated with SPM on multivariate analysis.

Patient characteristics	Crude RR	95% CI	Adjusted OR	95% CI	*p*-value
Age ≥25	3.03	1.78-5.18	2.59	1.21-5.53	0.014
Monthly income ≥10,000	1.59	1.12-2.27	1.24	0.67-2.29	0.503
Live in Bangkok	0.53	0.37-0.76	0.37	0.19-0.75	0.006
Married	2.53	1.76-3.66	2.02	1.10-3.72	0.023
Spouse or girlfriend	5.02	1.66-15.18	42.74	5.68-321.60	<0.001

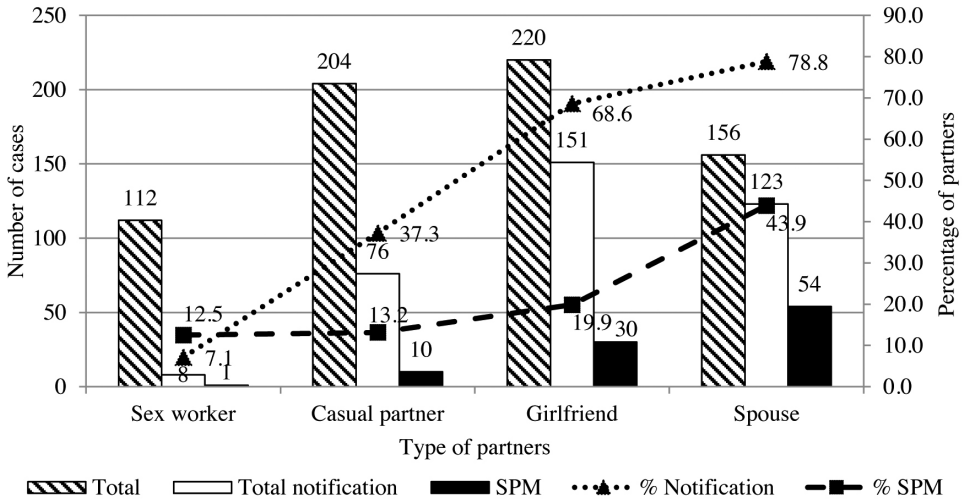

Fig 1–Results of PN and SPM by partner types.

median period for seeking care of partners was 2.5 (range: 0-92) days. Twenty-six partners (28%) came to the hospital with the index case. Eighty percent of partners presented for treatment within 9 days. Sixty-one partners (66%) were found to have a STI: 54 had gonorrhea, 4 had gonorrhea and chlamydia, 1 had gonorrhea and candidiasis, 1 had chlamydia only and 1 had herpes simplex infection. A pelvic examination and laboratory testing were not performed in 12 partners (13%). All partners who presented for evaluation were treated for gonorrhea after collecting laboratory specimens.

Multivariate analysis was done to determine the relationship between index characteristics and PN; being a government worker and having a spouse or a girlfriend were factors associated with PN of at least 1 partner (OR=5.25 and 8.37, respectively) (Table 3). Regarding the relationship between index characteristics and SPM; being aged ≥ 25 years (OR=2.59), married (OR=2.02) and have a spouse or a girlfriend (OR=42.74) were factors associated with SPM, whereas living in Bangkok was a factor associated with less successful in partner management than living outside (OR=0.37) (Table 4).

Having a spouse or a girlfriend was the only factor associated with both PN and SPM; therefore, the relationship between percentage of notification or percentage of SPM and partner types was explored using the chi-square. Both percentage of notification and percentage of SPM were associated with partner types (p<0.001 for both variables). The majority of partners notified were spouses or girlfriends. Most spouses (78.8%) and girlfriends (68.6%) were notified and the highest percentage for SPM was among spouses (43.9%). Only 12.5% of SW and 37.3% of casual partners were notified and SPM was very low in both groups (7.1% and 13.2%, respectively) (Fig 1).

DISCUSSION

PN should include all contacts: heterosexual, homosexual, males and females and SW. In this study we analyzed only gonorrhea among heterosexual males be-

cause of the completeness of the data. All index cases underwent the same process of counseling and advise to notify their partners.

The number of partners per index case in our study was 1.66. This is lower than a study from China (1.79 per index case, Shumin *et al*, 2004), the United Kingdom (UK) (1.70 per index case, Low *et al*, 2006) and the Netherlands (3.20 per index case, van Duynhoven *et al*, 1998). These differences may be due to different recall periods in the different studies. In our study, the recall period was 2 months, shorter than the 3 month period for China, the UK, and the Netherlands. However, our number could be an underestimation, since a behavioral survey of military conscripts and male employees in Thailand found having multiple sexual partners was common (47.9%) among conscripts and among male employees (46.1%) (Kladsawad *et al*, 2009).

The highest incidence of gonorrhea in our study was among youth (aged <25 years). Adolescents and young adults are at higher risk for contracting STI, because they are having more unprotected sex, are biologically more susceptible to infection, more frequently engage in sexual relationships and have lower access to care (CDC, 2015).

Of the 418 studied cases, 72.3% notified their partners using a contact slip. Our results were higher than in a report from Rwanda (58.0%) where the acceptability of the program was low (Steen *et al*, 1996) and a report from China (40.2%) (Shumin *et al*, 2004). This could be due to differences in cultural behavior by country. Thai people tend to accept a physician's request. Patients who were government workers and had spouses or regular girlfriends were more likely to notify their partners. In Thailand, most government workers are in the middle economic class, generally moderate to well educated, and understand the importance of PN. These results are similar to a study from Puna, India where the factors affecting intention to notify their regular partners were higher economic class, level of comfort regarding informing their partners and understanding the necessity of investigating their partners (Sahasrabuddhe *et al*, 2002).

In our study, 53.0% of reported partners were notified, which is much higher than in a report from China (23%) (Shumin *et al*, 2004). Fifty-four point three percent of reported partners in our study were spouses or girlfriends, which is similar to a report from China (57.2%) (Shumin *et al*, 2004). This may be due to having a close relationship, feeling guilty about the risk to their partners or being afraid of contracting STI from their partners. PN of spouses and girlfriends is easier than casual partners because they can be contacted more easily. An attempt should be made to discover barriers to PN and determine which cases are less likely to notify their partners and develop appropriate interventions in order to improve coverage. Only 12.5% of SW and 37.3% of casual partners were notified due to insufficient contact information, which is higher than a report from China of SW and casual partners (1.8% and 17.1%, respectively) (Shumin *et al*, 2004). Most SW and casual partners were left to seek care for themselves. In asymptomatic cases, which is more common among women than men with gonorrhea, the infected partners may not know they have gonorrhea or seek treatment. They are at high risk for developing complications and transmitting infections to their sexual partners. Screening of asymptomatic contacts of STI patients should be promoted (CDC, 2015).

In our study, 9 cases were given PDPT. They were given the drugs because their partners could not seek STI care. Many studies have reported the benefits of PDPT (Handsfield *et al*, 2006; Shiely *et al*, 2010). PDPT must be weighed against the missed counseling, evaluation for other STI, failure to treat the partner, the missed chance to notify other contacts of the partner and adverse drug reactions (Stekler *et al*, 2005). One study reported PDPT was associated with a higher prevalence of unsafe sex compared to partners who sought STI care (Handsfield *et al*, 2006). Further studies of PDPT in Thailand are needed. For partners receiving PDPT, information about the partner compliance with treatment should be obtained at case follow-up.

In our study, the time for the partner to seek health care ranged from 0 to 92 days with a median of 2.5 days. Eighty percent of our partners sought care within 9 days. This is markedly shorter than 16 days reported in a study from the Netherlands (van Duynhoven *et al*, 1998). In our study, 26 partners came to the hospital on the same day; 88% were spouses. To increase coverage, health personnel should consider contacting the partner directly if the partner does not present for treatment within 9 days. Friendly, convenient service, such as fast tract or free service for partners, can also encourage health care seeking. The majority of partners who presented for treatment in our study (91%) were spouses or girlfriends of the index cases. Only 7 were casual partners and only one was a sex worker. These results are similar to previous studies where PN was effective for regular partners but not for casual partners or SW (van Duynhoven *et al*, 1998; Shumin *et al*, 2004).

In our study, the percentage of partners who presented to our facility for STI management was not high, so the outcomes of many partners is unknown. The percentage of STI among partners may not reflect the true figure. Efforts should be made to improve PN and SPM. STI screening services for SW and other high risk populations should be made available.

The level of SPM in our study was low: 25.9% of those notified. Our results are higher than a report from the Netherlands (10.0%) (van Duynhoven *et al*, 1998), lower than a report from China (20.5%) (Shumin *et al*, 2004) and markedly lower than the 5-year median national SPM level in Thailand during 2003-2007 (57.7%) (STI Cluster, 2008). This would be due to changes in sexual practice among the Thai population: having multiple partners, having sex with casual partners, having unprotected sex and engaging in sexual relations at a younger age (STI Cluster, 2008) and a weaker PN system since the health care changes in 2002. The SPM rate in our study was low but the PN rate was high (72.3%). Cases may not have actually notified their partners, their partners may have ignored the notification or they may have sought STI care at another location. Greater efforts are needed to encourage favorable behavior among patients in order to increase the treatment coverage of partners. This can include a conditional referral approach when patients are unable to inform their partners and are requesting the STI service to perform PN. Telephone reminders may be another option for counselors to increase SPM rate since it has been found to be an effective method (Apoola *et al*, 2004). E-mail or text message notifications may be another option (Hogben and Kachur, 2008). It is important to improve the provider notification and treatment system for SW. Provider notification has been shown to be superior to case PN (Mathews *et al*, 2001). However, this is a labor intensive,

resource consuming activity and might not be feasible in many locations. In practice, both patients and doctors prefer the patient referral method (Melvin *et al*, 2009), which is more convenient, cheaper (Handsfield *et al*, 2006), easier to implement in primary care (Low *et al*, 2006) and less stigmatizing.

The SPM rate in our study may have been underestimated. The results included only partners who sought treatment at Bangrak Hospital. Some partners might have sought care at other facilities (Benjarattanaporn *et al*, 1997). Partners who presented without contact slips or did not mention the index case were not included in this study. It is possible the contact slips were lost or were not returned to the clinic.

Patients with SPM had the following characteristics: aged ≥25 years, married or having a spouse or a girlfriend. In the Netherlands and the UK, studies found no relationship between SPM and age, address or marital status but having a girlfriend was associated with SPM (van Duynhoven *et al*, 1998; Low *et al*, 2006). The differences between those studies and ours could be differences in definitions or culture. Those co-habiting, divorced and separated were included in the married category in the UK study (Low *et al*, 2006) but not ours. Living in Bangkok was a factor associated with less successful in partner management than living outside. A large proportion of partners who lived outside Bangkok presented to Bangrak Hospital for treatment. This may be due to limitations in STI facilities outside Bangkok, where patients living in Bangkok had more STI service locations to choose from.

In conclusion, PN is a routine practice at Bangrak Hospital. It is more successful among government workers, and those with spouses or girlfriends. The majority of casual partners and SW were not notified. Strategies to strengthen PN are needed to reach these partners. Interventions other than PN, such as routine STI screening in high risk groups, should be considered. The low percentages of PN and SPM seen in our study require further studies to determine why these percentages are so low. The Thailand National Communicable Disease Act, launched in 2015, may be useful for enhancing SPM. This requires cooperation of the index case for reporting the outcomes of their notification to health care authorities. The system for managing STI needs to be improved to increase PN and SPM rates and reduce STI prevalence.

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