

## Factors Affecting Appropriate Management of Patients with Sexually Transmitted Infections in Japan

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Physicians should educate patients with sexually transmitted infections (STIs) on measures to prevent reinfection and should also undertake human immunodeficiency virus (HIV) testing after diagnosis of STIs. These preventive measures are important, but it is not known to what extent these procedures are followed in Japan. We conducted a cross-sectional study to investigate the proportion of patients with STIs who received appropriate management from physicians, namely recommendation of HIV testing, encouragement of condom use and examination and/or treatment of sexual partners, to elucidate the factors affecting institution of each measure. From a mailshot of 566 physicians, 409 (72.3%) responded, with 176 diagnosing an STI in 967 patients. The proportions applying the 3 measures were low (recommendation of HIV testing: 27.0%; encouragement of condom use: 64.8%; examination of sexual partners: 17.5%), and were related to the sex of the patients and numbers of patients diagnosed by the physicians. Female patients received better care than male patients, particularly with respect to recommendation of HIV testing (odds ratio: 2.82). Physicians who diagnosed more than 20 STI patients tended not to provide appropriate management. These findings suggest the necessity for better physician management of patients for effective prevention of STIs.

**Key words:** sexually transmitted infections, patient care management, human immunodeficiency virus testing, physician

Sexually transmitted infections (STIs) are amongst the most serious infections among adolescents in Japan [1-4]. The numbers of human immunodeficiency virus (HIV) infections and acquired immune deficiency syndrome (AIDS) patients are still increasing in Japan. The 2007 Report of the Japanese Ministry of Health, Labour and Welfare revealed that over 1,000 HIV cases and over 400 AIDS cases were newly notified in Japan in 2007, and the majority

(92.3%) of these patients were male [5].

HIV infections are mainly transmitted by sexual intercourse. In a study by Huhn GD *et al.*, 20% of patients with HIV had another STI concomitantly [6]. Furthermore, previous studies indicated that STIs are associated with increased risk of HIV transmission [7-9]. Therefore, STI patients should undergo HIV testing. In Japanese public health centers, free anonymous HIV testing is available.

Repeat infections with STIs are often observed [10, 11]. Patients are likely to be infected repeatedly because they have sexual intercourse with their sexual partners without condoms before their treat-

ment is completed [12, 13]. Thus, to prevent repeat infections, STI patients undergoing treatment should be encouraged to use condoms and their sexual partners should receive timely medical examination and appropriate treatment, if required. In Japan, there are few specialized clinics for STIs. STI patients are mainly diagnosed by physicians of 3 specialties (obstetrics and gynecology, urology, and dermatology). In the guideline for prevention of sexual transmitted diseases formulated in 2000 and revised in 2006 by the Health, Labour and Welfare Ministry, it was recommended that obstetricians/gynecologists and urologists educate their patients during consultation about the prevention of STIs by using condoms [14]. Physicians have a good opportunity to educate their STI patients after diagnosis. However, there has been no study as to whether physicians utilize the opportunity appropriately.

Physicians' behavior and attitude in regard to STI prevention, and the approximate frequency of STI patients they manage have been studied [15–24]. These studies have indicated that many physicians do not educate patients on STI prevention. However, both the actual proportion of STI patients who receive appropriate management from physicians, and the factors which affect the application of specific preventive measures are unknown. The 3 measures we define as appropriate for STI prevention, which physicians can manage directly, are recommendation of HIV testing, encouragement of condom use and examination and/or treatment of sexual partners. The purpose of this study was to explore the actual proportions of STI patients who were offered these 3 measures by physicians after diagnosis, and then to elucidate the factors which had an effect on the rate of use of these measures by the physicians.

## Materials and Methods

All physicians likely to diagnose STIs in hospitals and clinics in Okayama prefecture were identified from the Okayama Prefecture Medical Association's membership lists for the above 3 specialties, hospital or clinic websites, and phone books published by the Nippon Telegraph and Telephone Corporation. A questionnaire was sent to the 654 physicians individually, asking them to report on the STI cases they newly diagnosed during the 5 weeks between January

25th and February 28th, 2006.

We defined STI patients as patients with the following 6 diseases: genital chlamydia trachomatis, gonorrhoea, genital herpes/herpes simplex virus, condyloma acuminatum/human papilloma virus, syphilis, and nongonococcal nonchlamydial urethritis. The criteria for diagnosing these 6 diseases were defined as pathogen detection or clinical presentation. For each STI patient, the following information was obtained from the physician: the diagnosed disease, patient age and sex, and the management of the patients by the physicians. Regarding the physicians' management, the following 3 questions were asked: whether they recommended HIV testing, whether they encouraged condom use, and whether they provided examination and/or treatment to a sexual partner of the patient. We used the following phrases for these measures: HIV testing, condom use and examination of sexual partners. In addition to the above information, we also asked the physicians their age, sex and specialties. The questionnaires were anonymous, but did have the name of the hospital or clinic where the physician worked. We requested that the physicians return data even if they did not diagnose any STI patients during the study period. After the study period, telephone interviews were conducted with the physicians who had not returned their questionnaires. Fig. 1 shows the questionnaire used, translated from Japanese into English.

We calculated the actual proportion of appropriately managed patients for either sex. Then we analyzed the relationship between the proportion of well-managed patients and the factors relating to patients (sex, age and diagnosed disease) and physicians (age, sex, specialty, number of patients diagnosed and clinical setting). The analysis was performed using Epi Info ver. 3.3.2. This study was conducted after obtaining approval from the Ethics Committee of Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences in September 2005.

## Results

We sent forms to the 654 identified physicians (Fig. 2). However, 51 physicians answered that they were not in fact specialists in obstetrics/gynecology, urology, or dermatology; 13 physicians had been transferred; and 24 physicians had already retired or

No. of patient	Diagnoses	Sex of patient	Age of patient	HIV testing	Condom use	Examination and/or treatment of sexual partner
Example	gonorrhea, genital chlamydia trachomatis, condyloma acuminatum, genital herpes, syphilis, nongonococcal nonchlamydial urethritis	Male	24 y.o.	Recommended	Encouraged	Provided
		Female		Not recommended	Not encouraged	Not provided
1	gonorrhea, genital chlamydia trachomatis, condyloma acuminatum, genital herpes, syphilis, nongonococcal nonchlamydial urethritis	Male	_____ y.o.	Recommended	Encouraged	Provided
		Female		Not recommended	Not encouraged	Not provided
2	gonorrhea, genital chlamydia trachomatis, condyloma acuminatum, genital herpes, syphilis, nongonococcal nonchlamydial urethritis	Male	_____ y.o.	Recommended	Encouraged	Provided
		Female		Not recommended	Not encouraged	Not provided
3	gonorrhea, genital chlamydia trachomatis, condyloma acuminatum, genital herpes, syphilis, nongonococcal nonchlamydial urethritis	Male	_____ y.o.	Recommended	Encouraged	Provided
		Female		Not recommended	Not encouraged	Not provided
4	gonorrhea, genital chlamydia trachomatis, condyloma acuminatum, genital herpes, syphilis, nongonococcal nonchlamydial urethritis	Male	_____ y.o.	Recommended	Encouraged	Provided
		Female		Not recommended	Not encouraged	Not provided
5	gonorrhea, genital chlamydia trachomatis, condyloma acuminatum, genital herpes, syphilis, nongonococcal nonchlamydial urethritis	Male	_____ y.o.	Recommended	Encouraged	Provided
		Female		Not recommended	Not encouraged	Not provided
6	gonorrhea, genital chlamydia trachomatis, condyloma acuminatum, genital herpes, syphilis, nongonococcal nonchlamydial urethritis	Male	_____ y.o.	Recommended	Encouraged	Provided
		Female		Not recommended	Not encouraged	Not provided

Fig. 1 Participating physicians submitted this questionnaire.

died. Therefore, a total of 566 physicians (215 obstetricians and gynecologists, 136 urologists, 143 dermatologists, and 72 general practitioners who also accepted dermatological cases) received forms for participation in this study.

Of the 566 physicians, 157 did not respond, including 59 obstetricians and gynecologists, 52 urologists and 46 dermatologists. Therefore, a total of 409 physicians responded, a rate of 72.3%. Among these, 309 physicians responded by mail, and 100 physicians responded by telephone interview. There were 156 obstetricians and gynecologists with a response rate of 74.2%, 84 urologists with a response rate of 61.8%, and 169 dermatologists and general practitioners with a response rate of 78.0%.

One hundred and seventy-six of the 409 physicians (43.0%) diagnosed patients with one or more STIs during the 5 weeks (Table 1). Of these, 107 (60.8%) were obstetricians and gynecologists and 145 (82.4%) were male physicians. More than half were in their 40s and 50s. The proportion of physicians who diagnosed less than 4 STI patients was 63.6%. On the other hand, the proportion of physicians who diagnosed more than 20 STI patients was 6.3%.

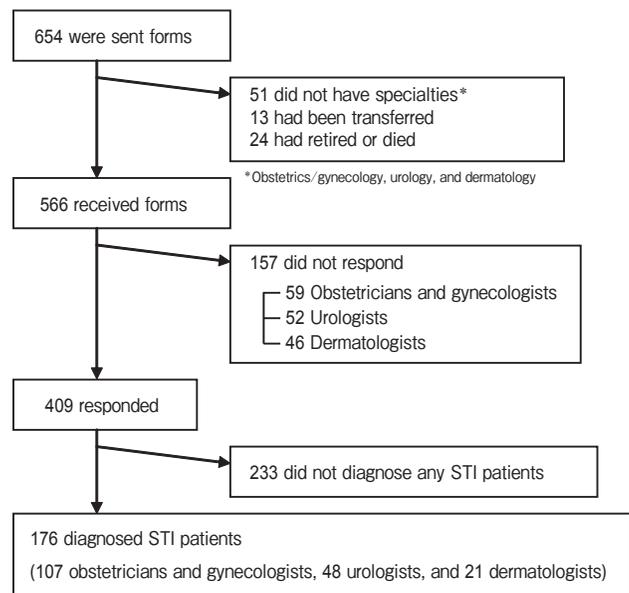


Fig. 2 Selection process for the 176 physicians whose answers we analyzed.

During the 5 weeks, 453 male patients and 514 female patients were diagnosed with one or more STIs (Table 2). In regard to the relationship between

**Table 1** Characteristics of physicians\* who diagnosed sexually transmitted infection (STI) patients

	n	Specialty of physician		
		Obstetrics/Gynecology	Urology	Dermatology
Total	176	107	48	21
Sex				
Male	145	83	47	15
Female	24	17	1	6
Unknown	7	7	0	0
Age (years)				
<40	30	16	11	3
40-59	95	59	26	10
≥60	37	25	8	4
Unknown	14	7	3	4
Practice Setting				
Clinic	83	56	17	10
Hospital	93	51	31	11
Number of physician's diagnoses in 5 weeks				
1-4	112	65	29	18
5-9	32	22	8	2
10-19	21	17	4	0
≥20	11	3	7	1

\*Physicians who diagnosed STI patients during 5 weeks (Jan 25th-Feb 28th 2006).

the sex of the patients and the specialties of the physicians, 97.7% of female patients consulted an obstetrician or gynecologist while 84.5% of male patients consulted a urologist.

Among the physicians who provided the numbers of patients they diagnosed with an STI, some did not inform us of their management of these patients. As a result, we did not acquire 16.8% (76 among 453, HIV testing), 21.6% (101 among 453, condom use), and 22.3% (98 among 453, examination of sexual partners) of answers about male patients, and 4.5% (26 among 517, HIV testing), 6.0% (36 among 517, condom use) and 6.4% (34 among 517, examination of sexual partners) of answers about female patients.

Of the 3 preventive measures provided by the physicians, the one most frequently performed was encouragement of condom use, which was made in 64.8%, of cases (Table 3). The proportions of patients who received a recommendation of HIV testing and examination of sexual partners were very low. When stratified by sex of patients, the proportions of male patients who received the appropriate measures

were lower than those of female patients on all 3 counts (Table 3). On condom use and HIV testing, the proportions of female patients were significantly higher than male patients (Table 3, odds ratios: 1.50 (95% confidence interval (CI): 1.12-2.02) and 2.82 (95% CI: 2.00-3.98), respectively). The results of the analyses of the 3 measures are shown in Tables 4, 5 and 6. We also analyzed the relationship between patient management and the factors listed in Table 1, such as age and sex of physicians and clinical setting. Female patients who were diagnosed by female physicians aged 40 or over were significantly less likely to be recommended HIV testing or to be encouraged condom use than those diagnosed by female physicians aged under 40 (odds ratios: 0.06 (95% confidence interval (CI): 0.02-0.21) and 0.33 (95% CI: 0.12-0.88), respectively). Other than these relations, there were no consistent tendencies across the 3 measures. The specialty of the physician was strongly correlated with the sex of patients. Thus, in the analysis we used the sex of the patient as a factor rather than the specialty of the physician.

**Table 2** Characteristics of STI patients

	Male	Percent	Female	Percent
Number of patients	453		514	
Age of patients (years)*	33.1 ± 11.4		27.0 ± 10.2	
Disease				
Chlamydia	157	34.7	323	62.8
Gonorrhea	150	33.1	56	10.9
Genital herpes/HSV	44	9.7	72	14.0
Condyloma acuminatum/HPV	48	10.6	66	12.8
Syphilis	4	0.9	4	0.8
NGNCU	96	21.2	6	1.2
Specialty of physicians who diagnosed patients				
Obstetrics/Gynecology	19	4.1	502	97.7
Urology	383	84.6	9	1.8
Dermatology	51	11.3	3	0.6

\*Mean ± SD

NGNCU, Nongonococcal nonchlamydial urethritis; HSV, herpes simplex virus; HPV, human papilloma virus.

**Table 3** Number and proportion of STI patients who received appropriate management by physicians, and female/male odds ratios

	Condom use*				Examination of sexual partners**				HIV testing***			
	N <sup>†</sup>	n <sup>‡</sup> (%)	OR <sup>§</sup>	95% CI <sup>¶</sup>	N <sup>†</sup>	n <sup>‡</sup> (%)	OR <sup>§</sup>	95% CI <sup>¶</sup>	N <sup>†</sup>	n <sup>‡</sup> (%)	OR <sup>§</sup>	95% CI <sup>¶</sup>
Total	838	543 (64.8)			833	146 (17.5)			868	234 (27.0)		
Sex of patients												
Male	355	211 (59.4)	1.00		352	52 (14.8)	1.00		377	61 (16.2)	1.00	
Specialty of physicians <sup>#</sup>												
Obstetrics/Gynecology	19	13 (68.4)			19	17 (89.5)			19	11 (57.9)		
Urology	310	188 (60.6)			305	32 (10.5)			309	44 (14.2)		
Others	16	10 (62.5)			28	3 (10.7)			48	6 (12.5)		
Female	483	332 (68.7)	1.50	1.12–2.02	481	94 (19.5)	1.40	0.95–2.07	491	173 (35.2)	2.82	2.00–3.98
Specialty of physicians <sup>#</sup>												
Obstetrics/gynecology	472	328 (69.5)			470	91 (19.4)			480	171 (35.6)		
Urology	9	3 (33.3)			9	3 (33.3)			9	1 (11.1)		
Others	2	1 (50.0)			2	0 (0.0)			2	1 (50.0)		

\*Encouragement of condom use, \*\*Providing sexual partner's examination and/or treatment, \*\*\*Recommendation of HIV testing, <sup>†</sup>Number of patients, <sup>‡</sup>Number of patients who received appropriate management, <sup>#</sup>Specialty of physicians who diagnosed the STI patients, <sup>§</sup>Odds ratio, <sup>¶</sup>95% confidence interval.

As for HIV testing, there was no significant relationship between age of the patients and the rate of recommendation of testing (Table 4). Regarding the number of patients diagnosed per physician, the physicians who diagnosed 10–19 patients during the 5 weeks were most likely to recommend HIV testing to male patients (Table 4).

As for examination of sexual partners, teenage patients, both male and female, were less likely to be

provided with this measure than older patients. Physicians who diagnosed 10–19 patients during the 5 weeks were most likely to provide an examination of sexual partners (Table 5).

As for condom use, teenage female patients were more likely to be encouraged to use condoms than older patients (Table 6). Physicians who diagnosed more than 20 patients during the 5 weeks were least likely to encourage condom use (Table 6).

**Table 4** Number and proportion of STI patients for whom HIV testing was recommended, stratified by age of patients and number of physician's diagnoses during the investigation

HIV testing	Male patients				Female patients			
	N <sup>†</sup>	n <sup>‡</sup> (%)	OR <sup>§</sup>	95% CI <sup>¶</sup>	N <sup>†</sup>	n <sup>‡</sup> (%)	OR <sup>§</sup>	95% CI <sup>¶</sup>
Total	377	61 (16.2)			491	173 (35.2)		
Age of patients (years)								
<20	17	3 (17.6)	1.00		82	33 (40.2)	1.00	
20–29	139	21 (15.1)	0.83	0.20–4.00	267	90 (33.7)	0.76	0.44–1.30
≥30	201	37 (18.4)	1.05	0.26–4.88	142	50 (35.2)	0.81	0.44–1.47
Disease								
Chlamydia (single)	100	25 (25.0)	1.00		293	112 (38.2)	1.00	
Gonorrhea (single)	103	15 (14.6)	0.51	0.24–1.10	39	13 (33.3)	0.81	0.38–1.72
Chlamydia+Gonorrhea (co-infection)	19	3 (15.8)	0.56	0.12–2.31	16	5 (31.3)	0.73	0.22–2.36
Number of physician's diagnoses in 5 weeks								
1–4	80	13 (16.3)	2.01	0.86–4.71	115	33 (28.7)	0.67	0.35–1.29
5–9	62	7 (11.3)	1.32	0.46–3.64	140	51 (36.4)	0.96	0.52–1.76
10–19	53	25 (47.2)	9.26	4.14–20.93	156	59 (37.8)	1.01	0.56–1.84
≥20	182	16 (8.8)	1.00		80	30 (37.5)	1.00	

<sup>†</sup>Number of patients, <sup>‡</sup>Number of patients who were recommended HIV testing, <sup>§</sup>Odds ratio, <sup>¶</sup>95% confidence interval.

**Table 5** Number and proportion of STI patients with examination and/or treatment of sexual partners, stratified by age of patients and number of physician's diagnoses during the investigation

Examination of partners	Male patients				Female patients			
	N <sup>†</sup>	n <sup>‡</sup> (%)	OR <sup>§</sup>	95% CI <sup>¶</sup>	N <sup>†</sup>	n <sup>‡</sup> (%)	OR <sup>§</sup>	95% CI <sup>¶</sup>
Total	352	52 (14.8)			481	94 (19.5)		
Age of patients (years)								
<20	16	2 (12.5)	1.00		81	10 (12.3)	1.00	
20–29	138	21 (15.2)	1.26	0.24–8.64	261	46 (17.6)	1.52	0.70–3.40
≥30	198	29 (14.6)	1.20	0.24–8.09	149	38 (25.5)	2.67	1.19–6.15
Disease								
Chlamydia (single)	87	30 (34.5)	1.00		285	70 (24.6)	1.00	
Gonorrhea (single)	94	11 (11.7)	0.25	0.11–0.58	39	9 (23.1)	0.92	0.39–2.15
Chlamydia+Gonorrhea (co-infection)	18	0 (0.0)			16	4 (25.0)	1.02	0.27–2.36
Number of physician's diagnoses in 5 weeks								
1–4	80	13 (16.3)	15.23	3.14–100.64	111	14 (12.6)	0.46	0.20–1.06
5–9	60	13 (21.7)	27.58	5.55–185.50	140	17 (12.1)	0.44	0.20–0.97
10–19	53	24 (45.3)	64.97	13.71–421.78	150	44 (29.3)	1.33	0.68–2.61
≥20	159	2 (1.3)	1.00		80	19 (23.8)	1.00	

<sup>†</sup>Number of patients, <sup>‡</sup>Number of patients provided with examination of sexual partners, <sup>§</sup>Odds ratio, <sup>¶</sup>95% confidence interval.

There was no significant relationship between the type of disease and the proportion of each measure

except for examination of sexual partners among male patients. Patients with co-infections were not managed

**Table 6** Number and proportion of STI patients for whom condom use was encouraged, stratified by age of patients and number of physician's diagnoses during the investigation

Condom use	Male patients				Female patients			
	N <sup>†</sup>	n <sup>‡</sup> (%)	OR <sup>§</sup>	95% CI <sup>¶</sup>	N <sup>†</sup>	n <sup>‡</sup> (%)	OR <sup>§</sup>	95% CI <sup>¶</sup>
Total	355	211 (59.4)			483	332 (68.7)		
Age of patients (years)								
<20	17	11 (64.7)	1.00		83	67 (80.7)	1.00	
20–29	138	86 (62.3)	0.9	0.28–2.85	262	176 (67.2)	0.49	0.26–0.93
≥30	200	114 (57.0)	0.72	0.23–2.22	138	89 (64.5)	0.43	0.22–0.87
Disease								
Chlamydia (single)	88	55 (62.5)	1.00		288	208 (72.2)	1.00	
Gonorrhea (single)	96	66 (68.8)	1.32	0.69–2.54	39	29 (74.4)	1.12	0.49–2.57
Chlamydia+Gonorrhea (co-infection)	19	5 (26.3)	1.08	0.35–3.55	16	11 (68.8)	0.85	0.26–2.89
Number of physician's diagnoses in 5 weeks								
1–4	80	50 (62.5)	1.84	1.03–3.30	115	85 (73.9)	7.47	3.75–15.02
5–9	60	39 (65.0)	2.05	1.06–3.97	139	111 (79.9)	10.45	5.25–21.00
10–19	53	45 (84.9)	6.21	2.61–15.28	149	114 (76.5)	8.59	4.43–16.80
≥20	162	77 (47.5)	1.00		80	22 (27.5)	1.00	

<sup>†</sup>Number of patients, <sup>‡</sup>Number of patients provided with examination of partners, <sup>§</sup>Odds ratio, <sup>¶</sup>95% confidence interval.

more carefully than patients with single infections.

For male patients, the rate of implementation of the 3 measures decreased in the physicians who diagnosed more than 20 patients. The same tendency was observed in female patients for encouragement of condom use, but not for recommendation of HIV testing or examination of sexual partners.

## Discussion

This study found that physicians provided appropriate management to only a small proportion of STI patients. The rates of implementation of each measure varied depending on the sex of the patients and the numbers of STI patients diagnosed per physician. The low proportion of patients who received appropriate management (Table 3) agrees with the result of a previous study which indicated low rates of recommendation of HIV testing and education on condom use by physicians [15]. The low proportion of patients who received examination or treatment of sexual partners (Table 3) also agrees with the results of a previous study for urologists [24, 25]. From the results of the analysis, there was no consistent tendency between patient factors and each measure

instituted by the physicians, except for the sex of patients. Thus it is important to increase the rates of application of the 3 measures in male patients in particular.

The reason for the low proportion of management from physicians who diagnosed more than 20 STI patients during the investigation (Tables 4, 5, 6) is unclear. However, the impact of these physicians is substantial. That is, it is particularly desirable that physicians who see many patients provide appropriate management. The low proportion of patients who were recommended HIV testing by these physicians was likely a result of the cumbersome protocol for conducting HIV testing. In most cases, physicians must follow a relatively involved procedure for obtaining informed consent before HIV testing [26]. Furthermore, they need more time for consultation if the test result is positive. Potential solutions to this problem include providing patients with an explanatory leaflet in a medical setting or effectively utilizing social resources such as free HIV testing at public health centers. The usefulness and acceptability of using a leaflet for discussion before HIV testing have been shown in the previous study [27]. In addition, it is necessary to give physicians more information about

free HIV testing at public health centers because most of them do not know the dates and times of testing [28].

Although STI patients are a high-risk group for HIV, the proportion of STI patients who were recommended HIV testing was low among not only male but also female patients in this study. This indicated that HIV testing during STI treatment has not been a common practice in Japan. In the guideline for diagnosis and treatment of STIs published by the Japanese Society for Sexually Transmitted Infections, it is mentioned that physicians need to offer HIV testing to all syphilis patients, but HIV testing for patients with other STIs is not mentioned particularly [29]. This is considered to be one of the reasons why only a small population of patients was recommended HIV testing in the present study. In contrast, in the United States, it is stipulated in the STIs treatment guideline published by the CDC (Centers for Disease Control and Prevention) that all persons who seek evaluation and treatment for STIs should be screened for HIV infection regardless of whether the patient is known or suspected to have specific behavioral risks for HIV infection [26]. The CDC also recommended HIV testing as a routine part of medical care for all patients aged 13 to 64 in health care settings, because they estimated that a quarter of HIV-positive subjects have not been diagnosed [30].

This study suggested that only a low proportion of male patients are recommended for HIV testing. This is a particularly important finding because, in Japan, more than 90% of HIV-positive and AIDS patients are male, and most new cases are infected by sexual intercourse [5]. Adding a mention about the importance of HIV testing for male STI patients in the Japanese guideline could increase HIV testing for male patients. However, although awareness of this guideline is high, with about 80% of physicians having general knowledge of the publication, only half of physicians follow the guideline when treating their STI patients [24, 25]. Thus, in addition to adjusting the contents, the guideline must be further disseminated.

Regarding the low rate of examination or treatment of male patients' sexual partners, some urologists commented to us that it is difficult to examine or treat sexual partners of male STI patients because their sexual partners are often unspecified. In such cases, however, physicians should still endeavor to

examine or treat close partners.

Our study has several limitations. First, we may not have received responses from physicians who diagnose a large number of STI cases, because 27.7% (157 among 566) of physicians did not respond. If so, we might have underestimated the impact of the physicians who diagnose a large number of patients. Second, we did not receive approximately 20% of answers about the management of male patients, compared with only 5% of answers about females. The reason for this is that the urologist who diagnosed 55 patients did not respond about his patient management. We might have overestimated the proportion of male patients who received appropriate management because physicians who saw more than 20 patients tended not to manage patients well, and did not respond in this study. However, the tendency in the present study for male patients to receive less appropriate management than females would still be valid even if the urologist did not provide appropriate management to many male patients. Third, each physician who saw more than 20 patients during the study had a marked influence on the proportion of patients who received appropriate management. Therefore, we might have underestimated those proportions if the physicians who provided appropriate management did not respond to our survey. Fourth, we could not exclude the patients who visited obstetricians and gynecologists for pregnancy, for which HIV testing is routine. Therefore, HIV tests which were not done after diagnoses of STIs for pregnant women may be included. In those cases, we may have overestimated the proportion of female patients who were recommended for HIV testing by obstetricians and gynecologists. This may account for the higher proportion of female patients who were recommended for an HIV test.

In summary, the proportion of STI patients who received appropriate physician management other than treatment of the diagnosed STI (recommendation of HIV testing, examination of sexual partners and education regarding condom use) was very low, and was lower for male patients than female patients. In particular, it is necessary to increase the proportion of male patients who are given appropriate management. In addition, physicians who saw many patients tended not to provide appropriate management. Our results indicate that a number of measures, as discussed

above, should be implemented to improve the management of these cases.

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