MEN'S SEXUAL HEALTH

Degree of Planning of Sexual Intercourse Among Men From China, Japan, and Taiwan Taking Medication for Erectile Dysfunction: Findings of an Observational, Cross-Sectional Survey

Bang-Ping Jiann, MD,[1] Koichi Nakajima, MD, PhD,[2] Sonali Dighe, DNB, MSc,[3] Chad D. Harshman-Smith, MSE, MBA,[4] and Tarek A. Hassan, MD, MSc[3]

ABSTRACT

Introduction: Management of erectile dysfunction (ED) is beset with assumptions around spontaneity of sexual intercourse, requiring candor between the physician and patient if appropriate treatment is to be implemented.

Aim: To evaluate the degree to which men who take ED medications plan for and have sex.

Methods: Men from China, Japan, and Taiwan aged 40–70 years who had taken ED medications within the past 3 months were invited to participate anonymously in an online, self-administered survey that enquired about frequency and advance planning of sex, time between taking ED medication and intercourse, and treatment satisfaction. Data were analyzed using descriptive statistics.

Main Outcome Measure: Frequency of planning of sexual intercourse, planning and ED medication dosing interval, and frequency of ED medication use.

Results: Data from 604 respondents (mean age 50.8 years) from China (n = 254), Japan (n = 250), and Taiwan (n = 100) were collected. Men used ED medications a median of ≤4 times per month in all 3 territories. 76% who used ED medication during the past 3 months planned for sex on specific occasions, with 59% and 52% agreeing that they plan for sex on specific days of the week and times of the day, respectively. Most commonly, men planned for sex up to several hours to a day beforehand, with 94% taking ED medication within 4 hours of sex. Satisfaction with ED medication was generally high and related to erection rigidity, speed of onset, and safety.

Conclusion: Knowledge of the degree to which individuals with ED plan for sex may have important implications for the appropriate prescription of ED medication. The high degree of planning around sexual activities exhibited by men taking ED medication suggests there is a need for appropriate counseling to ensure that treatment is aligned with patient behavior. **Jiann B-P, Nakajima K, Dighe S, et al. Degree of planning of sexual intercourse among men from China, Japan, and Taiwan taking medication for erectile dysfunction: Findings of an observational, cross-sectional survey. Sex Med 2019;7:54–60.**

Key Words: Erectile Dysfunction; Phosphodiesterase Type 5 Inhibitor; Sexual Habits; Advance Planning; Sildenafil; Tadalafil; Vardenafil

INTRODUCTION

The introduction to clinical practice of phosphodiesterase type 5 (PDE-5) inhibitors in the 1990s represented a significant landmark in the treatment of men with erectile dysfunction (ED). These orally available, selective, safe, and effective drugs help to restore male sexual function, and have revolutionized the management of ED in a broad range of men, including those with mild-to-moderate impairment and severe ED.[1] PDE-5 inhibitors are primarily prescribed on demand, with dosing taken before sexual intercourse, but continuous once-daily dosing is also an option with longer-acting PDE-5 inhibitors, which have a prolonged terminal half-life compared with on-demand medications.[2]

Optimizing response to treatment is critical for patients' well-being, and requires the use of a medication that can be integrated into daily activities to improve adherence and the likelihood of treatment success.[1] The rational selection of an appropriate treatment is therefore dependent on an understanding of person-centered factors such as sexual behavior, yet relatively little is known about the preferences of men with ED regarding the degree of spontaneity or, conversely, planning of sexual intercourse.[3,4] Considerably more is known about treatment satisfaction of men receiving ED medications, although knowledge of treatment satisfaction within the context of understanding men's sexual behavior may contribute to better meeting their needs.[5–7]

One method of improving awareness of the sexual behavior of men with ED is to conduct a real-world investigation for which the data gathered are readily generalizable to the wider patient population. This approach is particularly appropriate for the Asian-Pacific population, a geographically and culturally diverse population where the overall prevalence of ED reported in individual studies ranges from 2% to 88%, with an overall age-standardized prevalence of 37%.[8–11] To gain insight into the population of ED medication users in specific territories in Asia, we therefore conducted an online, cross-sectional survey of men from China, Japan, and Taiwan. The principal objective of our research was to evaluate the degree to which men who take ED medications plan for and have sexual intercourse to understand whether existing ED management practices are meeting the needs of the men who take them. In accordance with this objective, we also assessed treatment satisfaction.

MATERIALS AND METHODS

Study Group and Design

An independent market research company was contracted to conduct an observational, cross-sectional, population-based online survey involving an anonymous sample of men with ED living in China, Japan, and Taiwan. The study was carried out in accordance with relevant industry code of conduct guidelines of the Marketing Research Society, the British Healthcare Business Intelligence Association, and the European Pharmaceutical Marketing Research Association, which offer industry guidance relevant to respondent privacy and data confidentiality. Institutional Review Board approval was not sought because it was deemed to be unnecessary for an anonymous, non-interventional survey.

Between October 7, 2015 and November 2, 2015, men aged 40–70 years were recruited from an online access panel and invited to complete a screening questionnaire. The final selection of participants for the self-administered survey allowed a probabilistic sample and was based on their initial responses regarding the presence or absence of several medical conditions and use of related classes of medications. To avoid the potential for selection bias, participants were unaware that the survey was specific to ED until their selection was confirmed by the independent

market research company on the basis that they had stated in the screening questionnaire that they either had a diagnosis of ED or had taken a PDE-5 inhibitor for ED in the past 3 months. Participants were informed within the survey introduction about the nature of the survey and their consent was registered within the online script. Participants were given an incentive for their participation and were not required to complete a prequestionnaire such as the International Index of Erectile Function (IIEF-5). The questionnaire was designed to be completed in approximately 10 minutes.

Outcomes

The survey inquired about ED medication use in the past 3 months, frequency of advance planning of sexual intercourse, time between taking ED medication and intercourse, frequency of intercourse, important attributes of ED medication, and satisfaction with ED medication (Supplemental Table 1). Respondents were invited to select from a range of possible responses tailored to the specific question, such as "always," "sometimes," "hardly ever", "never," "prefer not to say," or "don't know." In addition, the survey included questions on age, income, and comorbidities. Standard quality control measures were applied to assess the validity of the data collected. The survey was conducted in the local language of each territory.

Statistical Analysis

No formal hypothesis testing was undertaken for this study. As a result, the planned sample size was determined arbitrarily, with an intended sample size of 250 respondents per country. Low recruitment in Taiwan meant the sample was limited to 100 men. Baseline demographics and characteristics were summarized using descriptive statistics. For survey questions relating to sexual planning, frequency of sexual intercourse, and ED medication use, and satisfaction with ED medications, the percentage of men who gave specific responses to each question was determined. In addition, the median number of times men in each country had sexual intercourse and took ED medications each month was calculated. Participants had to provide a response to each question before proceeding with the online questionnaire, ensuring there were no missing values among completers.

RESULTS

Baseline Characteristics

Questionnaires were completed by 604 respondents (mean age, 50.8 ± 7.26 years) from China (n = 254), Japan (n = 250), and Taiwan (n = 100). Men from Japan had a higher mean age (54.1 ± 8.01 years) compared with those from China and Taiwan (48.7 ± 5.40 and 48.2 ± 6.23 years, respectively; Table 1). Most (55%) respondents were aged ≤50 years, including 66% and 72% of respondents from China and Taiwan, respectively. Overall, the most common comorbidities

Table 1. Respondent demographics and comorbidities

	China (N = 254)	Japan (N = 250)	Taiwan (N = 100)	Overall (N = 604)
Mean age, years (SD)	48.7 (5.40)	54.1 (8.01)	48.2 (6.23)	50.8 (7.26)
Age category, n (%)				
≤50	168 (66)	90 (36)	72 (72)	330 (55)
51–60	81 (32)	102 (41)	23 (23)	206 (34)
61–70	5 (2)	58 (23)	5 (5)	68 (11)
Comorbidities, n (%)				
None	0	26 (10)	3 (3)	29 (5)
Hypertension	67 (26)	60 (24)	63 (63)	190 (31)
High cholesterol	53 (21)	52 (21)	48 (48)	153 (25)
Prostate problems	110 (43)	32 (13)	25 (25)	167 (28)
Depression	26 (10)	30 (12)	17 (17)	73 (12)
Diabetes	47 (19)	35 (14)	30 (30)	112 (19)
Arthritis	52 (20)	18 (7)	35 (35)	105 (17)

SD = standard deviation.

were hypertension (32%), prostate problems (28%), and high cholesterol (25%).

Planning and Behavior

A high degree of planning for sex was observed, with most respondents overall (84%) indicating that they always or sometimes planned sexual intercourse in advance, including 95% of men from China, 73% from Japan, and 82% from Taiwan (Figure 1). This observation extended to specific occasions for sex. Among 564 of 604 (93%) respondents who indicated that they plan for sex at some level (ie, hardly ever/sometimes/always plan a specific time in advance), 429 (76%) either strongly agreed or tended to agree with the statement, "I plan when I am going to have sexual intercourse" (Table 2). In addition, 59% either strongly agreed or tended to agree with the statement, "There are specific days of the week I plan on having sexual intercourse," and 52% either strongly or tended to agree that "There are specific times of the day I plan on having sexual intercourse."

Overall, sexual intercourse was most often planned up to several hours in advance (39%), whereas another 26% of respondents overall indicated that they planned sex up to 1 day in advance (Table 2). Men in China and Taiwan were more likely than men in Japan to plan sex up to several hours in advance.

The most frequent interval between ED medication dosing and sex was >30 minutes but ≤1 hour, with 67% of respondents overall initiating sex within 1 hour of taking their ED medication (Table 2). In China, Japan, and Taiwan, time to intercourse after ED medication dosing was within 1 hour for 76%, 55%, and 74% of respondents, respectively, and within 4 hours for 98%, 89%, and 96% of respondents, respectively. Overall, 94% of men indicated that they have sex within 4 hours of taking ED medication.

Frequency of Sex and ED Medication Usage

Frequency of sexual intercourse varied from a median of 3.0 times per month among users of sildenafil and tadalafil in Japan

to a median of 4.0 times and 5.0 times per month among users of tadalafil and sildenafil, respectively, in China. In Taiwan, the median frequency of sexual intercourse was 4.5 and 4.0 times per month among users of sildenafil and tadalafil, respectively.

Men used ED medications in conjunction with their sexual activities a median of 4 times per month in China and Taiwan, and a median of 2.5 times per month in Japan. Sildenafil was the most commonly used ED medication: 73% of men from China, 41% from Japan, and 67% from Taiwan indicated that they had used sildenafil in the last 3 months. The use of more than 1 ED drug was common whether as a result of using sildenafil as an add-on medication or through using different drugs on different occasions, because a large proportion of men from all 3 territories indicated that they had used tadalafil, vardenafil, or another ED medication in the last 3 months (Table 3).

Satisfaction With ED Medications

Satisfaction with ED medication use was high, with 87% of sildenafil and tadalafil users overall either very or fairly satisfied with their ED medication compared with 85% of vardenafil users (Table 4). Respondents from China were more likely to be satisfied with their ED medication, with higher levels of
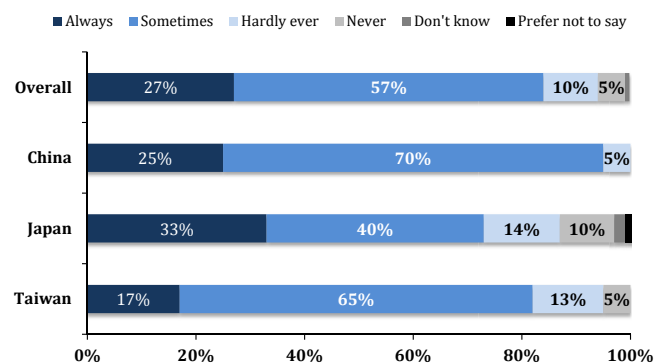

Figure 1. Frequency of planning sexual intercourse in advance.

Table 2. Erectile dysfunction medication users who plan sexual intercourse on specific occasions, and planning and dosing interval

	China (N = 253*)	Japan (N = 216*)	Taiwan (N = 95*)	Overall (N=564*)
Planning of specific occasions[†]				
I plan when I am going to have sexual intercourse	85%	74%	57%	76%
There are specific days of the week I plan on having sexual intercourse	64%	59%	44%	59%
There are specific times of the day I plan on having sexual intercourse	64%	45%	39%	52%
Length of time sexual intercourse is planned in advance				
Up to 1 hour	21%	10%	34%	19%
Up to several hours	49%	29%	38%	39%
Up to 1 day	27%	27%	18%	26%
Up to 1 week	3%	19%	7%	10%
More than 1 week	0%	10%	1%	4%
Don't know/prefer not to say	0%	6%	2%	3%
Length of time between dosing and sexual intercourse				
≤30 minutes	16%	8%	32%	15%
>30 minutes but ≤1 hour	60%	47%	42%	52%
>1 hour but ≤4 hours	22%	34%	22%	27%
>4 hours but ≤8 hours	2%	5%	1%	3%
>8 hours but ≤12 hours	0%	2%	2%	1%
≥12 hours	0%	0%	1%	0%
Don't know/prefer not to say	0%	4%	0%	1%

*Includes only patients who indicated in question 4 that they plan for sex at some level, ie, hardly ever/sometimes/always plan a specific time in advance;
[†]Strongly agree or tend to agree.

satisfaction associated with sildenafil and tadalafil. The highest rated product attributes were providing a rigid erection (92% overall), the ED medication works quickly (89%), and having a low level of side effects (88%; Figure 2).

DISCUSSION

The findings of this survey shed light on the sexual behavior of men from China, Japan, and Taiwan living with ED. To our knowledge, this is the first study conducted in an Asian population that has sought to understand the sexual behavior of men with ED in relation to the degree of planning of intercourse, as well as frequency of sexual intercourse and satisfaction with

treatment. Our findings suggest that 3 of every 4 men who used ED medication during the last 3 months plan for sex, with a high degree of planning evidenced by 59% and 52% of men either strongly or tending to agree that they plan for sex on specific days of the week and specific times of the day, respectively. Conversely, the finding that just 19% of men planned for sexual intercourse up to 1 hour in advance provides evidence of a lack of spontaneity in this sample. More commonly, men planned for sex up to several hours to a day beforehand, managing their ED medication dosing accordingly (94% took their ED medication within 4 hours of sexual intercourse). Satisfaction with ED medication was generally high across the range of ED treatments, with satisfaction most related to rigidity of erection, speed of

Table 3. Frequency of erectile dysfunction medication use in last 3 months

	China (N = 254)	Japan (N = 250)	Taiwan (N = 100)	Overall (N=604)
Any use in last 3 months				
Sildenafil	73%	41%	67%	59%
Tadalafil	43%	41%	25%	39%
Vardenafil	44%	34%	43%	40%
Other	45%	22%	0%	28%
Most recently used				
Sildenafil	51%	31%	42%	45%
Tadalafil	16%	40%	15%	22%
Vardenafil	20%	18%	5%	17%
Other	13%	11%	38%	16%

Table 4. Overall satisfaction with erectile dysfunction (ED) medication

	China (N = 254)	Japan (N = 250)	Taiwan (N = 100)	Overall (N=604)
Sildenafil				
Very satisfied	27%	19%	14%	22%
Fairly satisfied	68%	60%	69%	65%
Tadalafil				
Very satisfied	20%	23%	14%	20%
Fairly satisfied	78%	57%	64%	67%
Vardenafil				
Very satisfied	20%	20%	—*	20%
Fairly satisfied	68%	61%	—*	65%
Overall — All ED treatments				
Very satisfied	25%	20%	16%	22%
Fairly satisfied	69%	59%	59%	63%

*The number of vardenafil users from Taiwan was small (n = 5); none of these patients provided a response to the question on treatment satisfaction.

onset, and low level of side effects. Men used ED medications a median of ≤4 times per month in all 3 territories surveyed, suggesting that the prescription of on-demand or continuous ED medication should be weighed against the individual's needs that include factors such as frequency as well as planning of sexual intercourse. We further discuss the implications of these findings below.

Optimal treatment of ED is important to avoid potential consequences for men living with ED, such as reduced sexual satisfaction, diminished self-esteem and quality of life, and psychological and emotional turmoil, which may impact a person's likelihood of responding to treatment.[1,12] In this regard, a clinical encounter in which consideration is given to person-centered factors rather than just treatment ones may be more closely related to treatment success.[1] For example, both daily and on-demand therapy may have potential benefits if the physician takes time to understand the sexual behavior and preferences of the individual patient. This understanding can help in individualizing the treatment of ED based on knowledge of the patient's frequency and advance planning of sexual activities. If the patient is having sexual intercourse, for example, on up to 2 occasions per week and he plans his sexual activities, on-demand use of PDE-5 inhibitors may be the most appropriate choice. In contrast, daily use of a low-dose PDE-5 inhibitor might be a better option for the patient who has sexual
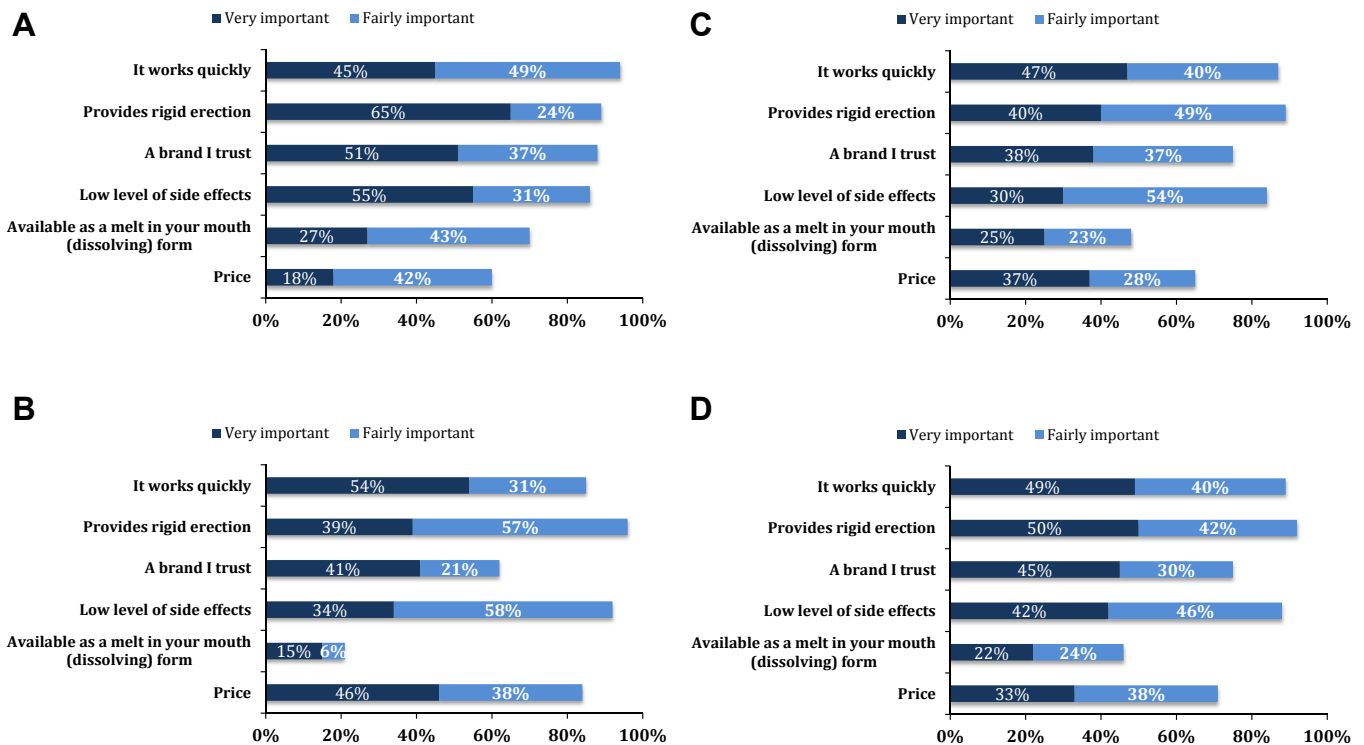
Figure 2. Importance of product attributes among users of erectile dysfunction medication: (A) China; (B) Japan; (C) Taiwan; (D) Overall.

intercourse on more than 2 occasions per week (ie, more than 8 times per month) and who does not plan his sexual activities. Most men in this study would appear to be more suited to an on-demand therapy, which is in keeping with their planning behaviors around sexual activity. In such men, the main limitation of daily therapy would be cost-effectiveness because the increased cost of such medications would not match the actual frequency of sexual intercourse.

Counseling the ED medication user about frequency and planning for sexual activity is not only good clinical practice given that patient expectations need to be matched to the pharmacokinetic characteristics of the drug, but is essential where the patient's desires for sexual activity need to be tempered against an existing comorbidity such as osteoarthritis or back pain, whereupon the patient might need to choose a time for sexual intercourse when pain is minimal.[13] In our study sample, we observed a high proportion of men overall with elevated cholesterol and hypertension. Although the cause of ED is complex and involves many potential causative factors including psychological determinants, studies of Asian men have consistently found a correlation between components of the metabolic syndrome and testosterone deficiency and ED.[14-17] Such findings support a role for counseling the patient with ED about lifestyle choices and modifiable risk factors, and it is also important to consider the potential negative impact of comorbidities on responsiveness to PDE-5 inhibitors, which may relate to the severity of endothelial function.[18,19] Consideration also needs to be given to including men's sexual partners in counseling to facilitate optimal outcomes.[20]

It is common for men with ED to consult multiple information sources concerning their erectile difficulties.[21] However, our findings suggest potential concerns given the high proportion of men from China who sought direction on how to take ED medication based on online information. This points to an unmet need for improved patient awareness about ED, and the risks of obtaining ED medication without a prescription from unlicensed sources, with the potential for counterfeit medicines and incurring harm.

Our study has several limitations. First, the cross-sectional design of the study is unable to determine causation. Rather, a study of this type is hypothesis generating, with the present findings suggesting that there is merit in further investigating the relationship between men's behavior in relation to frequency and planning of sexual intercourse, and the selection of appropriate treatment. Second, given the large target population in each of the 3 territories, the sample sizes were small, suggesting the potential for sampling errors. Although we attempted to recruit a probabilistic and accurate sample by using a screening questionnaire to first identify men with ED from the general population, our methodology remained dependent on an opt-in process that may not be representative of the population of interest. Third, the findings may not be representative of the larger population of men in Asia. As a culturally and ethnically diverse region, data are needed from other countries in the region to be confident that the data have external validity in Asian men in general. Fourth, ED diagnosis was based on respondent self-report rather than an office-based diagnosis or use of a validated questionnaire. The use of the 5-item IIEF-5 as a screening tool may have provided a more robust sample.[22] Fifth, only men were approached to participate in this survey; the inclusion of female respondents may have given more robust data in regard to frequency and planning of sexual intercourse. Finally, during the development of the survey there was an implicit assumption that planning of sexual intercourse by men would involve partner consent. This assumption was not tested.

The present study also had a number of strengths. The recruitment of participants via the Internet ensured respondent convenience and anonymity. Indeed, the design of the present study may have been particularly important to obtain robust data from Asian men, a high proportion of whom self-report ED yet admit to reluctance in seeking help.[8,10] Previous reports have shown that ED is a common health concern in the region, but a combination of sociocultural and economic factors are often barriers to appropriate care.[11] The present study confirms the findings of other studies in regard to the strong association observed between ED and comorbid conditions,[10] and advances knowledge in this therapeutic area specifically in relation to sexual habits. Although the data are restricted to just 3 territories in Asia, and may not be generalizable to all Asian men with ED, our study offers new insights to clinicians in the region who will appreciate the importance of candor with their patients to best align care with individual patient needs.

CONCLUSION

In conclusion, the majority of ED medication users in our sample planned for sex, which suggests that the appropriate prescription of daily compared with on-demand therapy is dependent upon knowledge of the sexual habits of the person with ED. ED medication users report a high rate of treatment satisfaction. The present findings emphasize the importance of providing counseling in concert with medical treatment for men who present with ED.

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Corresponding Author: Bang-Ping Jiann, MD, Department of Surgery, Kaohsiung Veterans General Hospital, 386 Dajong 1st Road, Kaohsiung City, Taiwan. Tel: 886-7-3468360; Fax: 886-7-3455064; E-mail: bpjiann@gmail.com

STATEMENT OF AUTHORSHIP

Category 1

(a) Conception and Design
Bang-Ping Jiann; Koichi Nakajima; Sonali Dighe; Chad D. Harshman-Smith; Tarek A. Hassan

(b) Acquisition of Data
Bang-Ping Jiann; Koichi Nakajima; Sonali Dighe; Chad D. Harshman-Smith; Tarek A. Hassan

(c) Analysis and Interpretation of Data
Bang-Ping Jiann; Koichi Nakajima; Sonali Dighe; Chad D. Harshman-Smith; Tarek A. Hassan

Category 2

(a) Drafting the Article
Bang-Ping Jiann; Koichi Nakajima; Sonali Dighe; Chad D. Harshman-Smith; Tarek A. Hassan

(b) Revising It for Intellectual Content
Bang-Ping Jiann; Koichi Nakajima; Sonali Dighe; Chad D. Harshman-Smith; Tarek A. Hassan

Category 3

(a) Final Approval of the Completed Article
Bang-Ping Jiann; Koichi Nakajima; Sonali Dighe; Chad D. Harshman-Smith; Tarek A. Hassan

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SUPPLEMENTARY MATERIAL

Supplementary data related to this article can be found at https://doi.org/10.1016/j.esxm.2018.10.006.