



ARTICLE

Positive sexuality in men with spinal cord injury

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Abstract

Study design Prospective study.

Objectives To analyze determinants of sexual pleasure in men with spinal cord injury (SCI).

Setting Centre Bouffard-Vercelli, Cerbere, France.

Methods Face to face interviews with men with chronic SCI who had an active sex life with a female partner, reliable erections permitting intercourse, and sought regular counselling with a sex therapist. Questionnaires: the International Index of Erectile Function (IIEF) and a modified Sexual History Form.

Results Thirty-three men were enrolled. IIEF subscores were high for erectile function (mean 27.6/30), sexual desire (mean 8.8/10), intercourse satisfaction (mean 11.9/15) and overall satisfaction (mean 8.7/10). Overall satisfaction was significantly related to the level ($p < 0.01$) but not the severity of the lesion ($p = 0.59$), positively correlated with intercourse satisfaction ($p < 0.001$), negatively with age ($p < 0.05$) and age at injury ($p < 0.01$), but not with time since injury ($p = 0.80$).

Orgasm was reported by 14 men (42%), and correlated strongly with antegrade ejaculation ($p < 0.001$), but not with overall satisfaction ($p = 0.81$). All men, except one, described enjoyable, long foreplay. Intercourse was associated with sensations of pleasure for 30 men (90%). After intercourse, 26 men (78%) experienced sensations of fulfilment, and 30 (90%) of relaxation. Most men expressed frustration, primarily in the case of absent or intermittent ejaculation or orgasm. Men described their female partners as taking more initiatives, and having a satisfactory sex life.

Conclusions A positive and satisfying sex life is achievable by the men's willingness to adapt their sexual behaviour coupled with the reward of physical pleasure experienced during intercourse.

Introduction

Sexuality is a key element relating to quality of life in men with spinal cord injury (SCI). Recovery of sexual function is one of the highest priorities of those men [1].

While many papers have been published on the effectiveness of treatments to restore erectile function and ejaculation following SCI [2–4], pleasure, orgasm and sexual satisfaction have received little consideration [5]. Previous studies showed that relationship factors such

as partner satisfaction and sense of intimacy, as well as mood, self-esteem and independence, were more important for men than genital function [6–10]. A recent study that sought to determine the reasons for pursuing sexual activity in both men and women with SCI, found that more than half of the subjects (58%) reported a need for intimacy as the primary reason, followed by sexual needs (19%), self-esteem (10%), and to keep their partner (8%) [11]. Concerns about bowel or bladder continence can also prevent an active sex life [11–13]. Erectile dysfunction represents a major determinant of psychological distress in this population [14]. For a long time, it was considered that sexual satisfaction in men with SCI was limited to their ability to please their sexual partner [15, 16]. However, some authors have stressed the need for a positive approach [5, 10, 17, 18], more focused on men's personal satisfaction than on any substitutes.

The aim of this study was to analyze determinants of sexual satisfaction after SCI in a selected population of men who had a regular sex life with few barriers.

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Methods

The study was conducted between January and June 2004. Participation was proposed to men with SCI who were regularly followed up in our neurourology clinic for bladder and bowel continence, and who sought regular counselling with the sex therapist as inpatients or outpatients. The inclusion criteria were men with chronic (more than 1 year) SCI, who had an active sex life with a female partner for more than 6 months at the time of the study and had reliable erections with pharmacological treatments that allowed intercourse (involving penetration). Exclusion criteria were the presence of urinary or faecal incontinence, and recent history of depression.

Face to face interviews were conducted with a sex therapist, using the International Index of Erectile Function (IIEF) questionnaire and a specific questionnaire partly derived from the Sexual History Form (SHF) [19]. Those interviews lasted for approximately 3 h over one or two sessions (max 2 days interval).

- The IIEF questionnaire contains 15 questions, rated from 0 or 1 to 5, yielding an overall score of 5–75 points. The results can be regrouped into five domains (erectile function, intercourse satisfaction, orgasmic function, sexual desire and overall satisfaction). Orgasmic function is rated from the responses to two specific questions about the frequency of ejaculation (question 9) and of feeling of orgasm or climax (question 10) [20]. Erectile function is a 6-item cluster (questions 1 to 5 and question 15) yielding a global score of 30. A score of 1–10 indicates severe erectile dysfunction, 11–16 moderate dysfunction, 17–25 mild dysfunction, and greater than 25 “normal” function [21]. The questionnaire was completed by the men during the interview based on their experiences during the previous 4 weeks (not their most frequent experience [21]). The information was then corroborated by the interviewer.
- The Sexual History Form (SHF) is a questionnaire that evaluates sexual functioning including desire, arousal,

orgasm, pain, frequency of sexual activities, and overall sexual satisfaction in the general population [19]. The original form consists of 28 multiple-choice items that have variable numbers of response options and different response scales. Response options are numbered and verbal descriptors of each are provided. It is also available in French (Formulaire d’Histoire Sexuelle). We altered the original SHF to make it relevant to men with SCI and sensory impairments: eight questions were removed and 20 questions were added, fitting the same multiaxial description system (desire, arousal, fantasy and imagination, orgasm, pleasure, frustration, partner orgasm and information). Questions were either open or closed using rating scales (the SHF rating method was used, with a visual analogue scale (VAS), or yes/no answers) (see Appendix).

- All the questions were asked by the sex therapist. During the interview, orgasm was defined as a transient feeling of intense pleasure that is accompanied by an altered state of consciousness. Other sensations (happiness, fulfilment...) were discussed with the patients without specific definitions.

Statistics

Data were analyzed using R 3.1.1 Development Core Team Software (R, Vienna, Austria). The men were categorized into two groups: orgasm and no orgasm. Chi-squared or Fisher’s exact tests were used to compare values of qualitative variables and ANOVA was used for variables with normal or approximately normal distributions. Correlations between variables were analyzed using Pearson’s or Spearman’s methods, as appropriate; $p < 0.05$ was considered significant for all analyses.

Statement of ethics

We certify that all applicable institutional and governmental regulations concerning the ethical use of human volunteers were followed during the course of this research.

Table 1 Population characteristics

	Level	Severity (AIS)	Type	Age (years)	Time injury (years)
Orgasm $n = 14$	7 tetraplegia, 6 paraplegia, 1 cauda equina	A: 10 B: 3 C: 1	UMN: 13 LMN: 1	39.8 (9.3) [26.4–59.5]	17.0 (10.1) [1.0–31.6]
No orgasm $n = 19$	8 tetraplegia, 9 paraplegia, 2 cauda equina	A: 13 B: 6	UMN: 17 LMN: 2	38.8 (12.5) [22.0–60.2]	9.7 (8.3) [1.1–26.7]
Total sample $n = 33$	NS ($p = 0.65$)	NS ($p = 0.60$)	NS ($p = 0.74$)	NS ($p = 0.81$)	S ($p < 0.05$)

Values for age and time since injury are given as means (standard deviations); [minima and maxima]

AIS ASIA Impairment Scale, UMN upper motor neuron, LMN lower motor neuron, S significant, NS not significant

Results

Fifty-eight men were asked to participate in the study. Twenty-five of them did not want to take part, mainly due to a lack of time or interest. The characteristics of the 33 participants are presented in Table 1. Mean age was 39.2 ± 11.1 years and mean time since injury was 12.8 ± 9.7 years. Fifteen men had tetraplegia, 15 paraplegia and three had cauda equina lesions. Most men had complete motor lesions (ASIA Impairment Scale (AIS) A or B, $n = 32$) and upper motor neuron lesions (UMN, $n = 30$). All men regularly used pharmacological treatments to enhance their erections, either oral Sildenafil ($n = 29$) or intracavernosal injections of prostaglandin E1 ($n = 4$). All men had new partners since the SCI. Fourteen men (42%) experienced orgasms, while 19 (58%) did not. Orgasm was significantly related to time since injury ($p < 0.05$) but not to age ($p = 0.81$), lesion level ($p = 0.65$), type ($p = 0.60$) or severity ($p = 0.74$).

IIEF results

Thirteen men in the orgasm group (93%) reported experiencing orgasm sometimes (about half the time) or most times (much more than half the time), only one man always experienced orgasm. Ejaculation was reported by 13 men, 12 of whom were in the orgasm group (eight sometimes, three most times and one almost always or always). Orgasm correlated strongly with ejaculation ($r = 0.9$, $p < 0.001$): only one man had ejaculation without orgasm, and two had orgasm without ejaculation. There were no correlations between orgasm and erectile function ($p = 0.18$), sexual desire ($p = 0.81$), intercourse satisfaction (0.91) or overall satisfaction ($p = 0.81$) (Table 2).

With their usual pharmacological treatments, 28 men had erectile function scores between 26 and 30 (no erectile dysfunction), four had scores between 17 and 25 (mild erectile dysfunction), and one had a score between 6 and 10 (severe erectile dysfunction); four of the five men with mild to severe erectile dysfunction were in the no orgasm group. Erectile function significantly correlated with intercourse satisfaction ($r = 0.4$, $p < 0.05$), but not with overall satisfaction ($p = 0.11$).

Sexual desire was high or very high in 31 men, but very low in two. Sexual intercourse was considered as highly or very highly enjoyable by 28 men, but not enjoyable by two (both in the no orgasm group).

Most men reported high levels of intercourse satisfaction (scores 11–15: $n = 26$) and overall satisfaction (scores 8–10: $n = 28$). Overall satisfaction was significantly related to the level (tetraplegia: mean 9.3; paraplegia: mean 8.5; cauda equina: mean 6.3) ($p < 0.01$) but not to the severity ($p = 0.59$) of the lesion, positively correlated with intercourse satisfaction ($r = 0.8$, $p < 0.001$), negatively with age ($r = -0.4$, $p < 0.05$) and age at injury ($r = -0.5$, $p < 0.01$), and was not correlated with time since injury ($p = 0.80$). Sexual desire correlated with intercourse satisfaction ($r = 0.7$, $p < 0.001$) and overall satisfaction ($r = 0.6$, $p < 0.001$).

Modified SHF Questionnaire

Desire, foreplay, arousal and intercourse

The frequency of sexual intercourse was around twice a week. The majority of men would have liked to have sexual intercourse 3 or 4 times a week. Most men initiated sexual intercourse (94%). All men usually responded to their partners' sexual advances. Sexual desire was experienced 3 to 4 times a week. Duration of foreplay (kissing, petting, hugging, etc.) was usually between 16 and 30 min, although 14 men reported durations of more than 30 min. All men described feelings of arousal (pleasure, excitement, "being turned on") more than 75% of the time. Vision during foreplay or penetration was important to enhance pleasure and excitement for the majority of men. Fantasies were regularly used by 54% of men to increase arousal. Fourteen men, including nine with tetraplegia, described intense pleasure during caresses over the whole body, even on insensate skin. Many men with complete lesions also described pleasure during oral sex (fellatio). All but one man described a high level of pleasure during foreplay (Table 3). In most cases, the female partner took more initiatives and assumed a more active sexual role to compensate for the physical barriers imposed by the SCI.

Table 2 IIEF results

	Orgasm Q 10 (0–10 scale)	Ejaculation Q 9 (0–5 scale)	Erectile Function Q 1 to 5, 15 (1–30 scale)	Sexual Desire Q 11–12 (2–10 scale)	Intercourse Satisfaction Q 6 to 8 (0–15 scale)	Overall Satisfaction Q 13–14 (2–10 scale)
Orgasm $n = 14$	3.4 (0.6) [3–5]	3.1 (1.1) [1–5]	28.9 (2.7) [20–24, 26–31]	8.9 (1.0) [7–10]	12.1 (1.9) [9–14]	8.9 (1.2) [7–10]
No orgasm $n = 19$	1.0 (0) [1]	1.2 (0.7) [1–4]	26.7 (6.2) [8–24, 26–31]	8.7 (1.7) [4–10]	11.7 (2.9) [4–15]	8.6 (1.9) [3–10]
Total sample $n = 33$	S ($p < 0.001$)	S ($p < 0.001$)	NS ($p = 0.22$)	NS ($p = 0.82$)	NS ($p = 0.65$)	NS ($p = 0.63$)

Values are given as means (standard deviations); [minima and maxima]

IIEF International Index of Erectile Function, S significant, NS not significant

Table 3 Modified SHF Questionnaire (Pleasure, Orgasm & Frustration)

	Pleasure foreplay	Pleasure coitus	Ejaculation	Happiness	Relaxation	Maximum pleasure	Partner satisfaction (0–6 scale)	Men frustration (0–3 scale)
Orgasm $n = 14$	Yes: 14 No: 0	Yes: 14 No: 0	Yes: 12 No: 2	Yes: 13 No: 1	Yes: 14 No: 0	Self: 8 Partner: 6	5.4 (0.6) [4–6]	1.6 (0.8) [1–3]
No orgasm $n = 19$	Yes: 18 No: 1	Yes: 16 No: 3	Yes: 18 No: 1	Yes: 13 No: 6	Yes: 16 No: 3	Self: 7 Partner: 12	5.5 (1.0) [2–6]	2.1 (0.9) [0–3]
Total sample $n = 33$	NS ($p = 0.38$)	NS ($p = 0.12$)	S ($p < 0.001$)	NS ($p = 0.09$)	NS ($p = 0.12$)	NS ($p = 0.25$)	NS ($p = 0.59$)	NS ($p = 0.15$)

Values are given as means (standard deviations); [minima and maxima]

SHF Sexual History Form, S significant, NS not significant

Duration of intercourse (penetration) was usually between 20 and 30 min, although 16 men reported intercourse that lasted for more than 30 min. Thirty men described sensations of pleasure during intercourse, which were very intense for 18; three men never experienced these feelings (one with tetraplegia, one with high and one with low paraplegia) (Table 3).

There were no statistical differences between the groups with and without orgasm for any of these data.

Orgasm

Fourteen men (42%) experienced orgasm: 12 during ejaculation and two without ejaculation. Ten of these men (eight of whom ejaculated) described signs of autonomic dysreflexia and increased spasms during the orgasm. Orgasm was followed by a feeling of well-being and fulfilment, and alleviation of spasticity that could last a few hours. Two men reported the symptoms of autonomic dysreflexia as very uncomfortable or painful, with pounding headaches and increased spasms accompanying ejaculation.

After intercourse, 26 men experienced sensations of happiness or fulfilment, and 30 described a sensation of relaxation.

The men's perception of their female partners' sexual satisfaction was that it was moderately to extremely high. They all achieved vaginal lubrication. One man perceived his partner's sex life as moderately unsatisfactory, and another reported she did not have orgasms. For 18 men, to please their partner was considered as more satisfying than their own pleasure, particularly in the no orgasm group, although the difference was not significant.

Other considerations

Sexual frustration was reported as moderate, with a non-significant trend towards higher frustration in men with no orgasm. Men related this frustration mainly to absent or intermittent ejaculation or orgasm, and secondarily to their lack of autonomy (Table 3).

All men had received information and/or counselling regarding sexual activity following the SCI, as a routine component of rehabilitation in our centre. Since all men had changed or met new partners after SCI, the women had not attended the educational workshops on sexuality provided during the rehabilitation process. The new partners had never attended consultations with the sex therapist, for personal reasons. Twenty-four men (74%) reported that their partners were highly informed (based on their own communication of information to their partners).

All men, without exception, reported that they had adapted their sexual activity after the SCI.

Discussion

The main determinants of a positive sex life were the willingness of the men to adapt their sexual life, and the experience of physical pleasure during foreplay and intercourse (through reliable erections). Physical and emotional aspects likely interacted, reinforcing desire and increasing the intimacy of the relationship. A shift of roles occurred, with the female partners playing a more active role in sexual activity. We feel that orgasm, which occurred mainly in men who ejaculated, could be interpreted as a reward.

Foreplay, intercourse and desire

Former studies have shown that foreplay plays an important role in the sex life of men with SCI: hugging, kissing, caressing, oral sex, visual aids or fantasy are commonly practiced. However, in those studies, foreplay was mainly practiced or encouraged as a substitute for intercourse [6, 7, 9, 22–25]. This study confirmed that the majority of men enjoyed lengthy foreplay, and that it increased their arousal. Furthermore, many men reported enjoying being caressed over the whole body, even on insensate skin and men with complete lesions reported that

their genitals could be sexually aroused by caresses or fellatio, as already reported by Alexander [6]. Pleasurable foreplay helps create a more intimate relationship [7, 8, 11, 15, 16, 26].

Rigid erections allow men to be more sexually active and to engage in intercourse [27], and can also improve ejaculation frequency [4], intercourse satisfaction [7, 12], and quality of life [28]. With appropriate pharmacological treatments, 84% of the men in this study were able to have reliable erections. Strikingly, most men reported pleasure during coitus. A possible explanation for this is that recovery of sexual capacity and potency helps them regain a sense of masculinity, allowing them to engage in intercourse if they wished to, as “normal men” would do [22]. For these men, intercourse was clearly not limited to the gratification of their partner after SCI, as has previously been reported [6, 8–10, 16].

The interview revealed that the couples adapted their sexual activity to their new boundaries, with the female partners assuming a more active sexual role, taking more initiatives and widening the sexual repertoire. The men were more passive but could still satisfy their partners through foreplay and vaginal penetration. Men with SCI have been said to be more attentive lovers, truly interested in providing pleasure to their female partners [29].

Most men reported a high level of sexual desire, which is in line with most studies in the chronic phase of SCI [5, 10, 23, 30, 31]. Interestingly, we found a significant correlation between sexual desire and intercourse satisfaction or overall satisfaction which might indicate that the pleasure received during foreplay and coitus provides a physical and/or emotional pay-off of being sexually active, which in turn increased desire [6, 24, 30].

Orgasm, autonomic dysreflexia, relief of spasticity, fulfilment

Forty-two percent of the men in this study reported experiencing orgasm, in particular those men who had antegrade ejaculation. These results are consistent with the literature, which reports that around 40% of men with SCI experience orgasm of a similar, weaker, or different quality than pre-injury [2, 5, 6, 15]. Orgasm is strongly related to antegrade ejaculation, either during sexual intercourse [6] or through penile vibratory stimulation [25]. In contrast with many studies [6, 24, 25], we found no effect of level, type or severity of the lesions on orgasm; however, one other study also reported no relationship with lesion severity [31]. Time since injury, but not age, significantly improved the chances of orgasm [32]. Orgasm can occur in men with SCI who do not ejaculate [6, 25, 33], as was the case for two men in the present study. Interestingly, there was no correlation between orgasm

and sexual satisfaction, as has been shown previously [30]. Orgasm is likely a combination of a genitally, reflex-based component and non-genital components that may play larger, compensatory roles when the reflex component is impaired [24]. A sense of frustration still prevailed in most men, related either to the absence of orgasm in the no orgasm group, or to the lack of reliable ejaculation and/or orgasm in the other group. Achieving reliable orgasm after SCI is definitely a bonus for these men [24].

Ejaculation was accompanied by clinical symptoms of autonomic dysreflexia in 10 men, two of whom reported these symptoms as very unpleasant. Autonomic dysreflexia is a common finding in men with SCI above T6, it often occurs during sexual activity, and can have both negative and positive consequences [24, 34, 35]. Negative signs include pounding headaches, discomfort, nausea, painful spasms, sweating and an increase in blood pressure that can be harmful [35]. On the other hand, it has been shown that with time and experience, men may incorporate the physiological signs of autonomic dysreflexia as a positive aspect of sexual activity, and learn to interpret them as sexually enhancing [11, 24, 36, 37]. Some authors have hypothesized that sensory substitution could be utilized to maximize sexual pleasure and orgasm through repetitive training [38].

Ten men reported a decrease in spasticity after ejaculation and orgasm. This anti-spastic effect has been reported following penile vibratory stimulation and can last for up to 3 h. It is more pronounced if antegrade ejaculation occurs [39]. Most men also described a sense of fulfilment and relaxation after intercourse, even if ejaculation or orgasm did not occur. This is probably similar to the resolution phase of sex during which muscles relax, blood pressure drops and the body slows down from its excited state, a normal component of the human sexual response cycle.

Sexual satisfaction

Sexual satisfaction was high in the men included in this study, in strong contrast with most studies [6, 8, 9, 13, 16, 23, 31, 40–42]. One explanation is that the participants in this study shared specific characteristics: in addition to having reliable erections, they sought regular counselling with a sex therapist, and showed a willingness to adapt their social and sexual lives. Most had chosen a partner after the SCI with whom they seemed to have developed open communication regarding their sexuality. Most importantly, they developed other aspects of sexuality such as intimacy and emotional sharing, which are major components of the adaptation to their new sexual lives, as has been shown in other studies [7, 11, 15, 16, 22, 26, 40, 43]. It has also been found that living with a stable partner in an enduring relationship [10, 13, 15, 16] or

having multiple partners [6] increases sexual satisfaction. Open communication can help to broaden the sexual experience through experimenting with alternative sexual expressions [8, 26]. We feel that the physical pleasure experienced by men during foreplay and intercourse, sometimes with the added reward of an orgasm, could be considered as a further physical component that motivated adaptation. Positive physical and emotional experiences helped to boost the men's sexual desire and self-esteem. Sexual satisfaction and quality of life have been shown to interact and reinforce one another [7, 10, 44, 45]. The correlation between sexual satisfaction and intercourse satisfaction further indicates that restoring reliable erections is an important step in the sexual rehabilitation process [12, 24].

Other aspects

Young age has been shown to positively influence sexual adjustment. Young people with SCI seem to have a higher degree of motivation and greater ability to redefine sexual goals and expectations [8, 10], as well as being more sexually active [12]. Satisfaction with sex life improves with time [16, 23, 41], and time also allows couples to adjust to the physical impairments and compensatory behaviour imposed by SCI [40]. While our results confirmed the relationship between younger age at injury and sexual satisfaction, we found no effect of time since injury, probably because this time was longer than in other studies (12.8 ± 9.7 years). Our results are in agreement with other studies, showing no effect of level and severity of lesion on sexual satisfaction [8, 10, 13, 27, 31], and also highlight the poorer satisfaction of men with a cauda equina syndrome and lower motor neuron lesions [13, 33, 46].

All men had attended an inpatient program for sexual rehabilitation and were followed by a sex therapist as outpatients. Counselling and education about the consequences of spinal cord damage on sexuality is of paramount importance and helps men adjust to their new sexual capacities [6, 10, 47–49].

Finally, the IIEF is frequently used as an outcome measure in clinical trials [20], but has been rarely used in men with SCI [4, 12, 14, 21, 28], although it is recommended by the Committee for the Measurement of Sexual Functioning after SCI for this population [21]. There is a need for specific tools to measure other aspects of sexual function, including satisfaction, in men with SCI.

Limitations

We selected participants with few barriers to sexual activity, and the high rate of orgasm (42%) found in this

study is probably the highest that can be achieved with currently available treatments. Midodrine, which increases the rate of ejaculation and orgasm with penile vibratory stimulation [3, 25], has a high rate of effectiveness; however, its use is restricted to clinical settings to control the risk of autonomic dysreflexia [24].

In France, the social security system provides free access to treatment for incontinence (including botulinum toxin) and some treatments for erectile dysfunction (intracavernous injections of prostaglandin), although some phosphodiesterase inhibitors (Sildenafil, Tadalafil) must be paid for by the individual (3 euros on prescription). Therefore, cost of treatment is likely a smaller barrier to sexual activity than in other countries.

Access to a sex therapist is often another barrier, either because of a lack of availability of therapists, or because men do not perceive the potential benefits for themselves. In our centre, consultations are freely available and systematically proposed; however, only a few men (roughly 10%) seek sexual guidance.

Finally, we believe the results of this study conducted in 2004 are still relevant today. There have not been any major changes in the treatment of either erectile dysfunction or incontinence over the last decade. However, the social environment is fast changing, and the extensive use of social media certainly changes the ways in which romantic or sexual encounters can occur [47]. Research is needed to determine if social networking helps to raise barriers for men with SCI to meet potential sexual partners.

Conclusion

The results of this study showed that men with SCI can live a positive sex life. This can be done through comprehensive application of the principles of sexual rehabilitation: [5, 47] adapt to their residual limitations by utilizing specialized therapies, encourage them to maximize the remaining capacities of the whole body, and to motivate them to stay open to rehabilitative efforts and new forms of sexual stimulation. It is the role of the medical and paramedical team to facilitate men's willingness through educational programs during the acute phase of the SCI, and via counselling with sex therapists thereafter.

More research is still needed to improve current treatments for erectile and ejaculatory dysfunction so that men can count on reliable erections during sexual activity at home.

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Author contributions JMS, MAN and JGP were responsible for designing and writing the protocol, for extracting and analyzing the data. They all contributed to writing the report. MAN conducted the interviews.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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