Association of JJ stent insertion and sexual function: A cohort study [version 1; referees: awaiting peer review]

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Abstract

Background: Indonesia is known as one of the world’s stone belt areas in Asia. Management of urolithiasis cannot be separated with the role of JJ stent insertion. However, a limited number of prior studies show that a patient with JJ stent is at risk for sexual function disorder. This study aims to evaluate the association of JJ stent insertion with sexual function, both in men and women.

Methods: This is a cohort study and the subjects were patients who had undergone JJ stent insertion in July - November 2017 at Kardinah Regional Hospital, Tegal, Central Java. This study was approved by the Research Ethic Committee of Kardinah Hospital (#445/3840/2017). Data were taken using standardized self-administered questionnaires before and after insertion of the JJ stent. Male sexual function was assessed using the International Index of Erectile Function (IIEF) score, while female sexual function was assessed using Female Sexual Function Index (FSFI).

Result: 60 male patients, with a mean of age 51.1 ± 10.6 years, and 33 female patients, with mean of age 49.6 ± 10.6 years old, underwent JJ stent insertion. A significant association was found in women before and after JJ stent insertion (p<0.05), with FSFI score 23.62 ± 0.64 before insertion and 16.7 ± 0.52 after insertion. A similar result was also found in men with total IIEF score 49.55 ± 2.3 before JJ stent insertion and 38.4 ± 1.7 after insertion.

Conclusion: This study confirms that JJ stent insertion may cause a disturbance of sexual function. However, the mechanism is not clear yet.

Keywords

sexual function, FSFI, IIEF, JJ stent, Tegal
Introduction

Sexual function plays an important role in the quality of life both in men and women. Sexual function is influenced by the complex interactions between the nervous, vascular, endocrine, and psychological systems. Sexual function in men is closely related to erectile dysfunction. Erectile dysfunction is defined as the inability to achieve and maintain an erection in order to achieve sexual satisfaction. The prevalence of erectile dysfunction varies between 4.5 and 53.5% depending on various studies according to clinical, methodological, demographic and aetiologic factors. In women the assessment of sexual disorders itself is quite difficult, unlike in men.

Risk factors for erectile dysfunction include drugs, diabetes atherosclerosis, depression, anxiety disorders, hormones, radiotherapy, nervous system disorders, chronic renal failure, smoking, and surgical intervention. Major pelvic surgical procedures such as radical prostatectomy, trans-urethral resection of prostate, as well as other rectum or urethral surgery may cause sexual function impairment. In recent years, there have been reports of sexual dysfunction in other endo-urological procedures.

Urinary tract stones are the most common urological case in Indonesia. In the general population, the risk of formation of stones in a lifetime is about 10.2% with peak incidence occurring at the age of 20–40 years. The management of urinary stones varies depending on the position, size and number of stones, the patient’s anatomical condition, and the surgeon’s own experience. Percutaneous nephrolithotomy (PCNL), ureteroscopy (URS), laparoscopy or open ureter are the main procedures of the kidney and ureter for the removal of stones.

Procedures to remove urinary stones must be accompanied by JJ stent insertion. Insertion of a JJ stent is a routine procedure to ensure that the flow of urine from the kidneys can get to the bladder, preventing extravasation in the area of operation during urinary stone removal procedures. Although the usage is safe, JJ stents can cause quality of life disorders by causing pain, discomfort, urinary tract infection, haematuria, irritation, and reduction in sexual function, which in the long term can cause psychological disorders such as insomnia, depression, and anxiety. In a study conducted by Giannarini et al., there was a strong association between the location of stent distal loop with respect to midline to disturbance of sexual function after stent placement.

Symptoms caused by the insertion of JJ stents may be managed with administration of alpha blockers, anticholinergics, or a combination of both. In a previous study, the drug tadalafil is said to be better for treatment than tamsulosin, as it has an advantage in managing sexual complaints. The use of pregabalin has also been studied to manage post-stent insertion complaints, but it does not provide an improvement to the sexual disorders that occur.

There have been many studies that examine JJ stent insertion association with irritating and painful complaints, but studies that evaluate the correlation with sexual disorders are remain few. Therefore, the present study sought to investigate the association of JJ stent insertion with sexual function in men and women.

Methods

Study design

This was a cohort study in which the subjects were all patients who received JJ stent installation at Kardinah General Hospital, Jakarta between July and November 2017.

This study was approved by the Research Ethic Committee of Kardinah Hospital (#4453840/2017). The study was conducted in accordance with the principles of the Declaration of Helsinki, and all patients provided written informed consent to participate.

Participants

Participants were recruited during consultation about insertion of JJ stent.

The inclusion criteria in the study were men and women >18 years old, who were candidates for JJ stent insertion procedure and had regular intercourse over the last 4 weeks before interviews. Exclusion criteria in this study were patients with prior history of sexual disorders, pelvic surgery, pelvic radiotherapy, renal failure, and neurogenic bladder.

Data collection

Data were taken one day before JJ stent insertion procedure using standardized self-administered questionnaire and the questionnaire was repeated perioperatively before JJ stent removal procedure. Sexual function was assessed using the International Index of Erectile Function (IIEF) questionnaire for men and the Female Sexual Function Index (FSFI) for women. Higher questionnaire scores indicate better sexual function. Each question describes a specific domain and each domain has a “factor” for counting the number of scores. In IIEF, the score may vary from 5–75. Erectile function domain score interpretation are distinguished into 5 categories: severe erectile dysfunction (1–10); moderate erectile dysfunction (11–16); mild-to-moderate dysfunction (17–21); mild dysfunction (22–25); and no dysfunction (26–30). While, for the other 4 domains, a higher score indicates less dysfunction. Meanwhile in FSFI, the score may vary from 2–36, with a normal score ≥ 26. FSFI scores < 26 are assumed to indicate sexual dysfunction.

Data analysis

Statistical analysis was performed using SPSS 22. Data analysis was done descriptively and quantitatively. Descriptive data: age, operating procedure, and duration of JJ stent. Quantitative data: IIEF and FSFI scores at the time before installation and after insertion. Statistical analysis was performed using a paired T test and Wilcoxon signed-rank test.

Results

A total of 93 subjects from July to November 2017 were included in this study; 60 men and 33 women. The average age of men
was 51.1 ± 10.6 years and women 49.6 ± 10.6 years. In both men and women the most frequent stone location was a proximal ureteral stone, with a higher stone burden seen in women. A total of 6.7% of the men underwent bilateral JJ stent insertion, while no women underwent this procedure. The length of stenting between groups of men and women was not different. Demographic data of participants can be seen in Table 1.

Table 2 shows the comparison of IIEF scores in the male group. There was a significant difference (p <0.05) in the IIEF total score results before (49.55 ± 2.3) and after (38.40 ± 1.7) JJ stent insertion. This is also seen in the scores of each subdomain of the IIEF questionnaire, where in the five subdomains showed a significant difference before and after stent placement.

Table 3 shows the comparison of FSFI score in women. There was a significant difference (p <0.05) in the total FSFI score before (23.62 ± 0.64) and after (16.7 ± 0.52) the insertion of the JJ stent. This is also seen in the scores of each subdomain, where each of the six subdomains showed a significant difference.

### Table 1. Demographic characteristics of participants.

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years</td>
<td>51.1 ± 10.6</td>
<td>49.6 ± 10.6</td>
</tr>
<tr>
<td><strong>Location, %</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyelum</td>
<td>8.3</td>
<td>27.3</td>
</tr>
<tr>
<td>Proximal ureter</td>
<td>50.0</td>
<td>42.4</td>
</tr>
<tr>
<td>Distal ureter</td>
<td>41.7</td>
<td>30.3</td>
</tr>
<tr>
<td><strong>Stone burden, mm²</strong></td>
<td>1.48 ± 1.58</td>
<td>3.7 ± 5.7</td>
</tr>
<tr>
<td><strong>Stent insertion side, %</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right</td>
<td>46.7</td>
<td>66.7</td>
</tr>
<tr>
<td>Left</td>
<td>46.7</td>
<td>33.3</td>
</tr>
<tr>
<td>Bilateral</td>
<td>6.7</td>
<td>0</td>
</tr>
<tr>
<td><strong>Duration of stenting, days</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCNL</td>
<td>3.3</td>
<td>6.1</td>
</tr>
<tr>
<td>URS</td>
<td>65.0</td>
<td>36.4</td>
</tr>
<tr>
<td>Pyelolithotomy</td>
<td>5.0</td>
<td>21.2</td>
</tr>
<tr>
<td>Ureterolithotomy</td>
<td>26.7</td>
<td>36.4</td>
</tr>
</tbody>
</table>

### Table 2. Comparison result for men using the International Index of Erectile Function score before and after JJ stent placement.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Pre-stenting</th>
<th>Post-stenting</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erectile function</td>
<td>21.78 ± 1.49</td>
<td>16.98 ± 0.89</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>Orgasmic function</td>
<td>6.75 ± 0.65</td>
<td>5.00 ± 0.63</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>Sexual dysfunction</td>
<td>6.92 ± 0.69</td>
<td>5.35 ± 0.60</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>Intercourse satisfaction</td>
<td>7.25 ± 0.85</td>
<td>6.00 ± 0.72</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>Overall satisfaction</td>
<td>6.85 ± 0.68</td>
<td>5.33 ± 0.62</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>Overall</td>
<td>49.55 ± 2.30</td>
<td>38.40 ± 1.70</td>
<td>&lt;0.05**</td>
</tr>
</tbody>
</table>

*Wilcoxon signed-rank test; *T paired test

### Table 3. Comparison result of FSFI before and after JJ stent placement.

<table>
<thead>
<tr>
<th></th>
<th>Pre-stenting</th>
<th>Post-stenting</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desire</td>
<td>3.67 ± 0.35</td>
<td>2.55 ± 0.34</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>Arousal</td>
<td>3.77 ± 0.18</td>
<td>2.70 ± 0.19</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>Lubrication</td>
<td>4.19 ± 0.19</td>
<td>3.06 ± 0.18</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>Orgasm</td>
<td>3.60 ± 0.26</td>
<td>2.23 ± 0.24</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>4.18 ± 0.22</td>
<td>3.45 ± 0.24</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>Pain</td>
<td>4.20 ± 0.20</td>
<td>2.70 ± 0.28</td>
<td>&lt;0.05*</td>
</tr>
<tr>
<td>Overall</td>
<td>23.62 ± 0.64</td>
<td>16.70 ± 0.52</td>
<td>&lt;0.05**</td>
</tr>
</tbody>
</table>

*Wilcoxon signed-rank test; *T paired test

### Discussion

Urinary tract stones are rare in urology. The prevalence of urinary tract stones in general is 5–12% in men and 4–7% in women worldwide. The upper urinary tract procedure is inseparable from the use of JJ stents. URS, PCNL, laparoscopy or open ureterolithotomy surgery are all procedures that often uses the JJ stent. Different complications can occur with the use of JJ stents, such as haematuria, dysuria, frequency, flank and suprapubic pain, to major complications, such as vesico-ureteric reflux, migration, malposition, encrustation, stent fracture, UTI, pyuria, incontinence, inadequate relief of obstruction, ureteric erosion or fistulation, a ‘forgotten stent’, necrosis and uretero-arterial fistula. In addition, it should also be considered as having a possible effect on sexual function. Sexual dysfunction can cause physical and psychological health disorders that will interfere with quality of life.

The aim of this study was to assess the effect of stent insertion on sexual function. The study used the IIEF and FSFI questionnaires to be able to assess more specifically disturbed sexual function. The IIEF score in men and FSFI score in women decreased significantly in post-JJ stent insertion. This shows that sexual function has interference after the installation of the JJ stent in both men and women. However, a clear mechanism for how JJ stent may interfere with sexual function remains unclear.

The results in this study were not much different when compared with other studies. Bolat et al. made a study comparing sexual function using IIEF in patients undergoing URS procedures. Follow-ups were made at one month and three months post-procedure. The study found no correlation between URS and sexual function disorder. Therefore, the sexual function disorder...
that occurred may be caused by the use of the JJ stent. In the study of Bolat et al. sexual dysfunction began in the first month of post-installation and improved 3 months’ post-op.

Akdeniz and Bolat performed a study comparing the FSFI score in patients undergoing URS procedures with JJ stent. Follow-up was done at one month and three months’ post procedure with the average of long time of installation of JJ stent 15.7 ± 2.4 days. The mean FSFI score in the that study was perioperative 14.5 ± 9.6, one-month post-op 12.8 ± 6.8, and post-operative 17.7 ± 5.4. FSFI score worsened in the first month and improved after the third month.

Eryildirim et al. did a study comparing the IIEF score in men and FSFI in women undergoing URS procedures with a JJ stent. In the study, the assessment was done before and one-month post-JJ stent installation. There was a significant decrease in both IIEF and FSFI scores before and after the installation of JJ stents. Similar results were also obtained by Sighinolfi et al. but with different assessment times, i.e. before and 45–60 days’ post-installation.

Conclusion
The installation of the JJ stent is a common practice in urological procedures. However, the installation of the JJ stent may cause sexual function impairment. Patients undergoing JJ stent installation procedures should be advised of this as it may impair their quality of life. The use of JJ stents needs to be reviewed, and if it is necessary to use the JJ stent, the length of installation should be as short as possible.

Data availability
F1000Research: Dataset 1. Answers pre and perioperatively to the International Index of Erectile Function (IIEF) and Female Sexual Function Index (FSFI) questionnaires for men and women, respectively, who underwent JJ stent insertion., https://doi.org/10.5256/f1000research.16608.d227254

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References

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