Original Article

Influence of seamless nursing on the stress state of patients undergoing transurethral prostate resection

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Abstract: Objective: Our aim was to explore the influence of seamless nursing on the stress state of patients treated by transurethral resection of the prostate (TURP). Methods: We prospectively enrolled 96 patients who were to undergo TURP and randomly divided them into the seamless care group (n=48) and the routine care group (n=48), according to a random number table method. The routine care group received conventional nursing care, while the seamless care group received whole seamless nursing care. Moreover, the heart rate, and systolic and diastolic blood pressure were measured before, during and after surgery. The adrenaline, noradrenaline and cortisol levels were determined by radioimmunoassay before and after surgery. The incidence of postoperative complications, the degree of satisfaction with care and self-rating anxiety scale (SAS) scores were also recorded. Results: The preoperative, intraoperative and postoperative heart rate, and systolic and diastolic blood pressure, preoperative and postoperative levels of adrenaline, noradrenaline and cortisol, and complication rates were all significantly lower in the seamless care group than in the routine care group (all P<0.05). The overall satisfaction was also significantly better, and the length of hospital stay was much shorter in the seamless care group than in the routine care group (both P<0.05). After surgery, the SAS scores of both groups were markedly decreased, while the SAS scores of seamless care group were significantly lower than those of routine care group (P<0.05). Conclusion: Seamless nursing care can effectively improve the operating room nursing, help patients reduce their stress response to surgery, alleviate anxiety and enhance satisfaction with overall care, which is worth of being popularized clinically.

Keywords: Seamless nursing care, transurethral resection of the prostate, operation room nursing, satisfaction with care

Introduction

Benign prostatic hyperplasia (BPH) is a common disease of urinary system in middle-aged and elderly men, and its incidence increases with age. Studies have confirmed that BPH is one of the main causes of dysuria in middle-aged and elderly men, and it has an incidence of 45-55% in men over 60 years old [1-3]. Symptoms of frequent urination, urgent urination, increased nocturia and incomplete bladder emptying may also occur, which greatly affects patients' quality of life [4]. Currently, surgery is the mainstay of treatment for BPH [5]. Mild symptoms can be alleviated by drug treatment, while severe obstructive symptoms can only be treated by surgery [6]. Through transurethral resection of the prostate (TURP), the symptoms of BPH patients can be significantly relieved [7]. However, postoperative complications are not uncommon, such as bleeding, bladder contracture, temporary urinary incontinence and urethral stricture [8]. Among them, postoperative bleeding is the most common short-term complication, and will cause serious consequences if it cannot be found in time [9-11]. Besides, other complications can also lead to anxiety, which is not conducive to postoperative recovery of patients. Thus, providing better nursing care is extremely important for BPH patients.

Seamless nursing is a high-quality model performed for perioperative patients throughout the whole nursing process [12, 13]. Nowadays, most of the surgical nursing models only incor-
porate simple preoperative education and routine intraoperative care, which cannot begin to truly accommodate the needs of patients, take care of their feelings during surgery, and implement customized care according to their needs. Hence, it’s very essential to provide seamless nursing care for surgical patients. Previous studies have reported that whole seamless nursing for patients undergoing cesarean section can promote postoperative early ambulation of patients and reduce the length of hospital stay [14, 15]. In comparison, patients with BPH who are older are more in need of high-quality nursing and seamless nursing care is very appropriate for their care. Therefore, we aim to investigate the effect of whole seamless nursing on the stress state of BPH patients during TURP, providing a theoretical basis for clinical nursing practice.

Materials and methods

General data

In this prospective study, 96 patients with BPH admitted to Sun Yat-sen University Cancer Center, State Key Laboratory of Oncology in South China, Collaborative Innovation Center for Cancer Medicine for treatment and surgery from January 2019 to January 2020 were selected. They were classified into the seamless care group (n=48) and the routine care group (n=48) according to a random number table method. Written informed consent was obtained from all patients and ethical approval for the study was given by the Ethics Committee of Sun Yat-sen University Cancer Center, State Key Laboratory of Oncology in South China, Collaborative Innovation Center for Cancer Medicine.

Patients were included if they were diagnosed with BPH and treated with surgery to improve their quality of life owning to the poor effect of drug treatment [16]; patients were aged between 55 and 75 years old with good compliance and complete data; patients were classified by the American Society of Anesthesiologists (ASA) as grade I-II with good cardiopulmonary function and no obvious injuries of important organ [17, 18]. Additionally, patients who could not tolerate the lithotomy position, had contraindications to prostatic surgery (e.g., urethral stricture, infections, and acute prostatitis), or had intraoperative conversion to open surgery were excluded. Patients were also excluded who could not tolerate surgery and anesthesia due to poor cardiopulmonary function, or those with poor compliance and incomplete clinical trial data were also excluded.

Anesthetic and surgical methods

In both groups, epidural anesthesia was performed at the L2-3 interspace in the lateral decubitus position and an epidural catheter was inserted. After correct placement of the catheter, a test dose of 3 mL lidocaine hydrochloride (Jiangsu Longer Pharmaceutical Co., Ltd., China, 5 mL, 181201) was injected. Then 5-10 mL of Naropin (AstraZeneca, UK, 10 mL, 190102) was used for anesthesia if there were no abnormal reactions (misplacement of the catheter into blood vessels, local anesthetic poisoning, allergy, etc.). After epidural block was established, the patients were turned to the lithotomy position for surgery, followed by TURP with a resectoscope. After the resectoscope entered the bladder, the ureteral orifice and bladder walls were examined for any abnormalities, and surgery was conducted to evenly remove the hyperplastic glands if there was no abnormality. Following the completion of cutting, exudation was examined for timely wound hemostasis and repair, and a three-cavity urinary catheter was placed for continuous bladder irrigation after surgery [19, 20].

Nursing methods

The routine care group was given conventional nursing care during the perioperative process. Before surgery, routine education was introduced by relevant nurses to inform precautions for surgery and anesthesia. After the patients entered the operating room, the operating room nurses checked the general data of patients, made preanesthetic and preoperative preparations, and assisted anesthesiologists and surgeons to complete the corresponding work. After surgery, the ward nurses continued to perform routine nursing care, including observation of patients’ postoperative reactions (e.g., whether or not nausea or vomiting occurred) and the color of bladder irrigation fluid.
The seamless care group was given whole seamless nursing care. First, a whole seamless nursing group was established for this project, which was composed of 1 head nurse and 6 charge nurses. The nurses were trained before the experiment to ensure a complete nursing process, smooth handover of patient data, and application of the principle of seamless nursing; the group leader was responsible for supervising, summarizing and providing timely feedback.

Preoperative nursing: After the patients entered the ward, their disease and basic conditions (past history, allergic history and surgical history) were studied in detail by the nurses in order to help the patients receive corresponding preoperative examinations and treatments effectively. Meanwhile, the nurses also explained the purpose and role of these examinations and treatments in plain language. One day before surgery, the operating room and the basic process of anesthesia and surgery were demonstrated to the patients and their families so as to pacify their minds, and minimize their anxiety and fear. For those with sleeping problems caused by tension, sedative drugs could be appropriately applied as an adjuvant therapy. On the day of surgery, the patients received monitoring of vital signs, and preoperative psychological counseling. During the preoperative handover, the operating room nurses checked and confirmed the information before the patients entered the operating room.

Intraoperative nursing: After patient handover, the operating room nurses checked the general data with surgeons and anesthesiologists again, helped explain the basic situation of anesthesia and surgery to relieve the patients’ doubts and pacify their emotions. Subsequently, the nurses inserted the intravenous needle for intraoperative anesthesia and fluid infusion, helped the anesthesiologists place the patients in the anesthesia position, and relieved their fear of anesthesia with language and behavioral actions, so that epidural anesthesia can be achieved successfully.

Postoperative nursing: After patient handover, the ward nurses performed the monitoring of vital signs, answered the patients’ doubts or worries in detail, and asked them to lie in horizontal position for 6 h. During the process, the patients were asked if there was discomfort or pain. For patients with severe and intolerable pain, analgesic drugs were used as an adjuvant therapy. For patients with nausea and vomiting, they were told to turn their head to one side to avoid aspiration. After surgery, the patients could not eat or drink until intestinal function recovered to normal to allow normal eating. If the patients had adverse reactions due to hunger, glucose was appropriately infused, professional psychological counseling was given in a timely manner, and the reasons for fasting were clearly explained to obtain a good understanding and promote compliance. In addition, the nurses paid close attention to the color of the bladder irrigation fluid. If the color became dark or blood clots were more visible, the nurses informed the chief doctors immediately. After the irrigation fluid was clear without blood clots, the catheter was removed. For those who couldn’t urinate spontaneously after the removal of the catheter, psychological counseling was conducted to instruct the family members to help them urinate smoothly. Following automatic micturition without gross hematuria, the patients could be discharged. Throughout the whole nursing process, there was no interruption in the handover of patient care and no inadequate hando-
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Outcome measures

Monitoring of basic vital signs: Heart rate (HR), systolic blood pressure (SBP), and diastolic blood pressure (DBP) were monitored before, during and after surgery in both groups.

Determination of stress indexes: The levels of adrenaline (AD), noradrenaline (NE) and cortisol (COR) were determined by radioimmunoassay before and after surgery in both groups. About 3 mL of fasting blood was drawn from each patient at 7:00 am using a TriCat TM ELISA kit (IBL International GmbH, Hamburg, Germany; RE58895).

Complications and length of hospital stay: The cases of postoperative temporary urinary incontinence were recorded in both groups, and the incidence rate was calculated. Complication rate = number of complications/total number of cases * 100%. In addition, the length of hospital stay was also recorded in both groups.

Nursing satisfaction and self-rating anxiety scale (SAS) scores: Patient satisfaction with care and anxiety levels were assessed [21, 22]. The Newcastle Satisfaction with Nursing Scale was used to evaluate the patient satisfaction of the two groups, which was categorized into three levels: very satisfied (>85 points), satisfied (70-85 points) and dissatisfied (<70 points) [23, 24]. Satisfaction rate = (very satisfied cases + satisfied cases)/total number of cases * 100%. Besides, the SAS was applied to evaluate the patient anxiety, and a standard score ≥50 was regarded as screening-positive criteria. Mild anxiety was defined as a score of 50-59 points, moderate anxiety as 60-69 points, and severe anxiety as >70 points.

Statistical analysis

All statistical analysis was done using the SPSS 19.0 and Graphpad Prism 5. The measurement data with normal distribution were expressed as mean ± standard deviation (X ± sd). Independent t-test was used for the comparison between the two groups. Chi-square test (χ² test) was adopted for the comparison of enumeration data expressed as case/percentage (n/%), and rank-sum test was used for rank variables. P<0.05 was considered statistically different.

Results

Comparison of general data

There was no statistical significance in the age, severity of BPH determined by B ultrasound,
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Comparison of vital signs

The preoperative, intraoperative and postoperative HR and blood pressure (BP) of patients in the seamless care group were significantly lower than those in the routine care group (P<0.05). See Table 2.

Comparison of stress indexes

The levels of AD, NE and COR in both groups after surgery were significantly decreased, as compared with those before surgery (P<0.05). Besides, the preoperative and postoperative levels were significantly lower in the seamless care group than in the routine care group (P<0.05). See Table 3.

Comparison of complication rates and length of hospital stay

The incidence rate of postoperative temporary urinary incontinence was significantly lower (31.25% vs. 52.33%, t=5.366, P<0.001), and length of hospital stay was much shorter in the seamless care group than in the routine care group (7.6±0.3 vs. 10.8±0.5, χ²=5.151, P=0.023). See Figures 1 and 2.

Comparison of nursing satisfaction and SAS scores

The satisfaction was markedly better and SAS scores were significantly lower in the seamless care group than in the routine care group (P<0.05). See Table 3.

### Table 3. Comparison of stress indexes

<table>
<thead>
<tr>
<th>Group/Indicators</th>
<th>Seamless care group (n=48)</th>
<th>Routine care group (n=48)</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>AD (pg/mL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before surgery</td>
<td>10.66±1.51</td>
<td>12.06±2.10</td>
<td>3.750</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>After surgery</td>
<td>7.99±1.26*</td>
<td>9.78±1.34*</td>
<td>3.371</td>
<td>0.003</td>
</tr>
<tr>
<td>NE (pg/mL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before surgery</td>
<td>11.69±2.13</td>
<td>12.83±2.59</td>
<td>2.355</td>
<td>0.021</td>
</tr>
<tr>
<td>After surgery</td>
<td>9.35±1.62*</td>
<td>10.13±1.55*</td>
<td>2.410</td>
<td>0.018</td>
</tr>
<tr>
<td>COR (nmol/mL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Before surgery</td>
<td>438.65±95.01</td>
<td>514.53±104.20</td>
<td>3.728</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>After surgery</td>
<td>371.05±71.19*</td>
<td>444.48±77.06*</td>
<td>4.849</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Note: Compared with the indexes before surgery, *P<0.05. AD: adrenaline; NE: noradrenaline; COR: cortisol.

![Figure 1. Comparison of incidence of postoperative temporary urinary incontinence. Compared with the routine care group, ***P<0.001.](image1)

![Figure 2. Comparison of length of hospital stay. Compared with the routine care group, *P<0.05.](image2)
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Table 4. Comparison of nursing satisfaction and SAS scores

<table>
<thead>
<tr>
<th>Group/Indicators</th>
<th>Nursing satisfaction</th>
<th>SAS scores Before surgery</th>
<th>SAS scores After surgery</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seamless care group (n=48)</td>
<td>83.33%</td>
<td>54.54±8.76</td>
<td>47.13±6.49</td>
<td>3.330</td>
<td>0.002</td>
</tr>
<tr>
<td>Routine care group (n=48)</td>
<td>62.50%</td>
<td>62.63±8.28</td>
<td>53.13±5.74</td>
<td>6.533</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>t/χ²</td>
<td>5.275</td>
<td>4.650</td>
<td>4.798</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>0.022</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: SAS: self-rating anxiety scale.

less care group than in the routine care group (both P<0.05). Furthermore, the SAS scores of the two groups after surgery were lower than that before surgery (P<0.05). See Table 4.

Discussion

BPH is one of the main causes of urinary retention and dysuria in middle-aged and elderly men, and those with BPH suffer a lot psychologically and physically. Nowadays, surgery is the main treatment for moderate to severe BPH, but many patients are fearful or uneducated about the disease and surgery. Therefore, psychological factors play an extremely important role in treating BPH, and doctors’ detailed answers about the disease and high-quality nursing will significantly relieve patients’ anxiety and provide better support for their compliance with surgery and other treatments. Previous studies have confirmed the advantages of the whole seamless nursing in patients undergoing other surgeries, however, there have been few reports on the advantages and disadvantages of the nursing intervention in patients with BPH [14, 26, 27]. Hence, we mainly investigated the effect of whole seamless high-quality care on the stress state of BPH patients undergoing TURP.

In our study, the results showed that the preoperative, intraoperative and postoperative HR and BP were lower in the seamless care group than in the routine care group, indicating that whole seamless nursing relieves the anxiety and tension of patients, and helps make their hemodynamics, BP and HR more stable, which is more conducive to the improved performance of surgery and postoperative recovery. The levels of AD, NE and COR before surgery in both groups were higher than those after surgery, revealing that surgery causes tension in patients, and increased hormones also lead to the increase of HR and BP. Furthermore, the hormone levels were decreased after surgery in both groups, suggesting that the anxiety of all patients was relieved much more after surgery; and the seamless care group showed lower hormone levels than the routine care group, confirming that whole seamless nursing can appropriately help improve mental health, and relieve the hormone changes caused by anxiety. In addition, the incidence rate of postoperative temporary urinary incontinence was significantly lower, and length of hospital stay was markedly shorter in the seamless care group than in the routine care group. The results reflect that whole seamless nursing can facilitate patient compliance and better help them urinate spontaneously and smoothly after removal of the catheter. Besides, our study identified that patients with whole seamless nursing showed a significantly better satisfaction with care and markedly lower SAS scores than those with conventional nursing.

There still remain some shortcomings, even though our study has confirmed that whole seamless nursing has obvious advantages for patients undergoing TURP. Since our sample size was small and the research time was limited, future studies will be needed to better understand whether whole seamless nursing is still superior in a big data environment by increasing the sample size and follow-up time in combination with investigations at other hospitals.

To sum up, whole seamless nursing can effectively promote excellent operating room nursing, help patients reduce their stress response to surgery, improve nursing satisfaction and patient anxiety, reduce complication rates, and shorten the length of hospital stay; therefore this treatment is worthy of being promoted in clinical practice.

Disclosure of conflict of interest

None.
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