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Original Article

Study on timing of preoperative fasting and water deprivation in patients receiving fiberoptic bronchoscopy

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ABSTRACT

Purpose: To compare the effects of different preoperative fasting intervals and water deprivation in patients receiving fiberoptic bronchoscopy (FB).

Methods: In total, 390 patients receiving FB were divided into two groups. The 200 patients in the experimental group had 100 mL semi-liquid food two hours before FB, and 190 patients in the control group had 250 g ordinary food four hours before FB. The incidence of nausea, vomiting, aspiration, dizziness, and palpitations and vital signs, oxygen saturation, and anxiety level before and after FB were recorded.

Results: There was no significant difference in the incidence of nausea, vomiting, aspiration, or palpitations; and respiration rate, heart rate, and oxygen saturation were not different between the two groups ($p > 0.05$). There were, however, significant differences in the incidence of dizziness, comfort level, anxiety, and blood pressure ($p < 0.05$).

Conclusion: Intake of 100 mL semi-liquid food two hours prior to FB is safe and feasible.

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1. Introduction

Preoperative fasting has been used in patients within mainland China since 1946 when Mendelson [1,2] proposed the standard protocol. This includes, in adults, no intake of solid food for 12 h and no water for four hours prior to the operation, which should reduce the risk for potential psychological and physical hazards. Fiberoptic bronchoscopy (FB)

technology is constantly improving, and its clinical application range is widening. However, the invasive and potential complications associated with FB operation in patients with nausea are important to consider. In order to prevent reflux, vomiting, aspiration, and suffocation, fasting and water ban times must be appropriately determined [2]. In this study, we evaluated 390 patients undergoing FB and implemented two different fasting times, and the effect of the two methods are compared.

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2. Materials and methods

2.1. Patients

In total, 390 patients undergoing FB examination were selected from January to December 2011. Patients were excluded if they had altered gastric emptying due to diabetes, gastritis, gastric duodenal ulcer, gastroesophageal reflux, and intestinal obstruction. For the experimental group, 111 were male, 89 were female, and the age range was 18–65 years (average age 46.72 ± 12.64). For education level, there were 42 cases of illiteracy, 15 cases of primary school, 81 cases of junior high school, and 62 cases of high school and above. For disease diagnosis, there were 63 cases with pulmonary tuberculosis and 11 cases of suspected tuberculosis. For the control group, the average age was 47.62 ± 12.31 years. For educational level, there were 11 cases of illiteracy, 56 cases of primary school, 71 cases of junior high school, and 52 cases of high school and above. For disease diagnosis, there were 66 cases of pulmonary tuberculosis, eight cases of suspected tuberculosis, 24 cases of lung cancer, 41 cases of suspected lung cancer, 11 cases of bronchial tuberculosis, eight cases of bronchiectasis, five cases of atelectasis after lung resection, five cases of pulmonary infection, four cases of pleurisy, three cases of pyothorax, three cases of lung syndrome, two cases of lung music bacterium ball, two cases of pulmonary cyst, two cases of hemoptysis, one case of mediastinum tumor, one case of silicosis, one case of pulmonary damage, and three other cases. In 22 cases, patients had multiple FB inspection experiences. The two groups were not significantly different in regard to age, sex, education level, illness, and FB inspection experience ($p > 0.05$).

2.2. Methods

2.2.1. Intervention methods

One day before FB, patients in the two groups were informed of the purpose and method of the study and informed consent was obtained. Patients were prepared for the procedure and told of the fasting and water ban. Details regarding dietary considerations were gathered, and 10 min line ecg monitoring was acquired. Five min prior to the procedure, a nurse prescribed patients oxygen masks (10 L/min) and monitored them after 10–15 min. After five min, lidocaine (2%) was administered for cricothyroid membrane puncture anesthesia in order to assist complete FB inspection. Patients in the experimental group received 100 mL semi-fluid (such as rice paste blisters, porridge, noodles, steamed bread, etc.) after the fast and water ban two hours prior to FB. Patients in the control group were given 250 g normal diet after four-hour fasting and water ban.

2.2.2. Observation content and evaluation standard

Prior to the procedure, patients were asked if they were thirsty, hungry, or felt unwell (e.g. dizzy), and their responses were recorded. In addition, patient breathing, heart rate, blood pressure, and blood oxygen saturation were monitored five min before the operation, and presence of patient nausea, vomiting, regurgitation, palpitations, etc. were documented.

The Zung self-rating anxiety scale (SAS) [3] is a self-assessment questionnaire used to evaluate anxiety. For each

question, a score of 0 means no or very little time and a score of 4 points means most or all the time. The scores were totaled and multiplied by 1.25, where a score of 50–59 points was considered mild anxiety, 60 to 69 was moderate anxiety, and more than 70 points was severe anxiety.

2.2.3. Data collection methods

Prior to the operation, SAS was used to assess patients' emotional state and required subjects to independently read and follow the instructions for the survey. For those unable to finish the test independently, the researchers assisted the patients to complete the questionnaire. Values for breathing, heart rate, blood pressure, and blood oxygen saturation level were recorded directly from the monitor.

2.3. Statistical methods

Statistical analyses were performed using SPSS 13.0 statistical software package (Chicago, IL, USA). Data are presented as the mean \pm standard error of the mean (SEM). Count data were analyzed using χ^2 test, and measurement data were compared with a t-test, where $p < 0.05$ was considered statistically significant.

3. Results

3.1. Comparison of preoperative discomfort and complications in control and experimental groups

In the experimental group, there were 22 cases of thirst and hunger, two cases of nausea, two cases of vomiting, two cases of heart palpitations, and three cases of arrhythmia and other complications (not including dizziness). In the control group, there were 76 cases of thirst and hunger, six cases of dizziness, four cases of heart palpitations and arrhythmia, and no cases of nausea or vomiting. For the two groups, thirst and hunger ($\chi^2 = 43.555, p < 0.05$) and dizziness ($\chi^2 = 6.414, p < 0.05$) were significantly different. Nausea and vomiting ($\chi^2 = 1.910, p > 0.05$) and heart palpitations and arrhythmia complications ($\chi^2 = 0.203, p > 0.05$) were not statistically different.

3.2. Comparison of preoperative breathing, heart rate, blood pressure, blood oxygen saturation, and SAS in control and experimental groups (Table 1).

3.3. Comparison of breathing, heart rate, blood pressure, and blood oxygen saturation in control and experimental groups five min after FB (Table 2).

4. Discussion

4.1. The importance of the composition of water and food consumed prior to FB and the role of gastric emptying

For FB inspection operations, patients with nausea are at risk for vomiting, aspiration, and suffocation because the fiber

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