

**ORIGINAL RESEARCH**

# COMPARISON OF TWO TURNING REGIMENS (1 VERSUS EVERY 2 HOURS) IN THE PREVENTION OF CONSTIPATION IN PATIENTS WITH STROKE

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**Abstract**

**Background:** Constipation is one of the most common problems in stroke due to inactivity and immobility.

**Objective:** To compare one hour and every two-hour turning regimens in the prevention of constipation in patients with stroke.

**Methods:** This was a quasi-experimental research with pretest posttest with control group design. There were 39 participants assigned in intervention group ( $n=17$ ) and control group ( $n=22$ ). The intervention group turned every one hour, while control group turned every two hours. The turning regimen was implemented for five days. A bowel score was used to measure constipation. McNemar Test and Fisher Test were used to measure and compare the bowel score between the two groups.

**Results:** There was no significant difference in the effect of two turning regimens on constipation ( $p > .05$ ). However, based on a descriptive result, there was a slight decrease in the number of constipations from 47% to 29.4% in the intervention group, and from 32% to 27% in the control group.

**Conclusion:** Turning might still become an effective way to prevent constipation in patients with stroke either every one hour or two hours without diet modification.

**KEYWORDS**

constipation; stroke; turning

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## INTRODUCTION

Constipation is one of the most often interference due to inactivity and immobility (Linton, 2012), bed rest and/or immobility (Lemone & Burke, 2011; Potter et al., 2013). Constipation is a change in frequency and volume of defecation and feces consistency caused by the lack of physical activity, the consumption of fibers, liquid intake (Yasmara et al., 2013) and specific medications (Potter et al., 2013). Constipation is not a disease, but a symptom, showed by the decrease of defecation frequency (less than once in 3 days or less than twice in a week), difficulty in feces excretion, excessive straining, inability for defecation when desire for defecation happens, and a hard feces (Potter et al., 2013). The result of a previous study showed that 55.2% of patients with stroke suffered new-onset constipation after 4 weeks of post-stroke, three of them suffered constipation

on the third day of post-stroke. Besides, those who were treated more than 2 weeks suffered more constipation (63%) than the others (28.6%) (Su et al., 2009).

The cause of constipation in patients with stroke is an indirect effect of immobility (Crisp et al., 2013). The prolonged physical inactivity is a relevant cause for functional constipation in healthy people (Lovino et al., 2013). The most possible major cause is an injury in the cortical and medullary nuclei area that affects the function of a sphincter and the modulation of an autonomous nervous system (Camara-Lemarrooy et al., 2014). The stroke could cause damage to the central nervous system components, one of them is motor cortex that cause mobility disorder (Crisp et al., 2013). A bad body movement,

intentionally or not, causes the decrease of peristaltic movement of the intestine as a trigger of constipation (Yasmara et al., 2013).

Constipation occurs due to the decrease of colon motility, as a result, it could prolong the feces transit time in the colon and causes most water content in the feces absorbed. Thus, the feces become dry, hard, and difficult to be excreted in the defecation process (Potter et al., 2013; Yasmara et al., 2013). The mobilization and/or activity could stimulate the peristaltic movement, strengthen the abdomen muscle and ease the elimination (Lemone & Burke, 2011). Lovino et al. (2013) recommends that early in-bed turning prevents constipation. Up to date, there is no study examine the effect of in-bed turning on the constipation in patients with stroke. This study aimed to compare the effect of every one-hour and two-hour turning regimen in constipation on the patients with stroke.

**METHODS**

**Study design**

This study employed a quasi-experimental design with pretest posttest with control group, which was conducted from January until March 2018 at Neurological Ward of Dr. Ramelan Military Hospital of Surabaya and Jombang General Hospital.

**Participants**

The target population was patients with stroke in Neurological Ward of Dr. Ramelan Military Hospital of Surabaya with average of 34 patients per month, and Jombang General Hospital with average 172 patients per month. The sample for this study consisted of 49 patients using consecutive sampling technique, which a treatment group (n = 26) was firstly recruited before a control group (n = 23). But there were 9 patients in the treatment group were dropped out from the study due to the use of laxative (7 patients), anti-diarrhea medication (1 patient), and fasting (1 patient) during the study. And 1 patient in the control group was also dropped out due to the use of anti-diarrhea medication during the study. Therefore, the final sample of the study was 39 patients, assigned in the treatment group (n = 17) and control group (n = 22). The inclusion criteria of the sample were: 1) patients with infarct or hemorrhagic stroke, suffered from immobility due to weakness or paralysis, 2) immobility due to bed rest condition like a hemorrhagic stroke at the first 14 days, and 3) having treatment at the first to third day. The exclusion criteria were: 1) patients with the use of laxative or anti-diarrhea in the last three days before the intervention, 2) fasting, and 3) Total Parenteral Nutrition (TPN) intake. The participants would be also dropped from the study if they were out of the treatment, moving to another ward or hospital, passed away, taking a laxative or anti-diarrhea therapy before and during the study.

**Instrument**

The instrument used to measure the constipation was Bowel Score questionnaire (Yasmara et al., 2013) by calculating and adding the defecation frequency with feces consistency level for the last three days. The constipation was enforced if the score

was less than 3. The questionnaire was addressed to the nurses who treated the patients and/ or the family who accompanied the patients in the hospital (Table 1).

**Table 1** Bowel Score For Constipation Diagnosis

| Score | Notes                                                                                 | Result                                 |
|-------|---------------------------------------------------------------------------------------|----------------------------------------|
| A     | Defecation frequency in the last three days                                           | A=.....x/3 days                        |
| B     | Feces constipation in the last three days<br>0 = none, 1 = hard, 2 = normal, 3 = soft | B =.....                               |
| A+B   | Defecation frequency + feces constipation level                                       | Bowel Score = A+B<br>.....+.....=..... |

**Intervention**

The intervention was performed by the researcher assisted by research assistants. The treatment group had a turning regimen every 1 hour in the day time (6 am – 6 pm) (turning to the right side position, in a supination position, and turning to the left side position with a prop of pillow in the back), and every 3 hours in the night time (6 pm – 6 am) (a supination position and turning to the strong side). The control group had a turning regimen every 2 hours in the day time (6 am – 6 pm) (turned to the right side position, a supination position, and the left side position with a prop of pillow in the back), and every 3 hours in the night time (6 pm – 6 am) (a supination position and turning to the strong side). The intervention was performed for five days. Pretest was done before the turning regimen was performed (day 1) and posttest was done after the intervention was completed (day 6) at the same time.

**Data analysis**

Data were analyzed using SPSS. McNemar Test was used to compare the bowel score before and after the treatment. Fisher Test was used to distinguish the bowel score between two groups (treatment and control) with  $\alpha < .05$ .

**Ethical consideration**

The ethical approval of this study was obtained from Dr. Ramelan Military Hospital of Surabaya with approval number of 01/EC/KERS/2018. Prior to data collection, the researchers explained to the patients and their families about advantages, goals, the methods, and rights of the patients to accept or refuse to be a respondent in this study. If they agreed to be a respondent, then they were asked to sign an informed consent form. In this study, all of the forms were signed by patients' families because the patients could not decide by themselves due to the clinical conditions.

**RESULTS**

**Demographic characteristics of participants**

The demographic data of participants were described based on the age, gender, and stroke type. The average age of participants in the treatment group was 66 years, with a range of 43-81 years, and the average age of participants in the control group was 67.86 years, with a range of 57-77 years. 58.9% treatment

was performed in the first day, 30.8% in the second day and 10.3% in the third day. The patients with stroke and constipation in the intervention group were 60% of males and 40% of females, and in the control group were 50% of males and 50% females. In the intervention group, 80% of participants were more than or equal to 60 years old and 20% less than 60 years old, while 100% of participants in the control group were more than 60 years old. The patients with a hemorrhagic stroke and constipation were 20% in the intervention group and 16.7% in the control group, while the patients with an infarct stroke with constipation was 80% in the intervention group and 83.3% in the control group. This indicated that the patients with a stroke and constipation were dominated by the patients with infarct stroke compared to the hemorrhagic stroke.

**Difference in constipation before and after turning for 5 days in the intervention and control group**

The results of McNemar test showed that the bowel score of pretest and posttest in the intervention group obtained p-value of 0.375 ( $p > 0.05$ ) (Table 2), which indicated that there was no statistical difference in bowel score before and after turning every one hour for five days in the intervention group. However, the results of descriptive statistics showed that there was a decrease of constipation from 47% to 29.4%. The patients with stroke who initially suffered from constipation and then healed were 4/8 (50%), and the patients with stroke who initially did

not have constipation and then suffered from constipation were 1/9 (11.1%). The patients with stroke who initially did not have constipation and did not suffer from constipation after five days were 8/9 (88.9%), and the patients with stroke who suffered from constipation before and after intervention were 4/8 (50%). Thus, it could be concluded that the turning regimen every one hour could cope with constipation as many as 50% and could prevent it as many as 88.9%.

In the control group, the result of McNemar test showed that the bowel score of pretest and posttest obtained p-value of 1.000 ( $>0.05$ ) (Table 2), which indicated that there was no statistical difference in bowel score before and after turning every two hours for five days. However, based on descriptive results, there was a decrease of constipation from 32% to 27% in control group. The patients with stroke who initially suffered from constipation and then healed was 6/7 (85.7%), and those who initially did not have constipation and suffered from constipation afterwards was 5/15 (33.3%). The patients with stroke who initially did not have constipation nor suffered from constipation after five days was 10/15 (66.7%), and those who suffered from constipation before and after treatment was 1/7 (14.3%). In conclusion, the turning regimen every two hours could cope with constipation as many as 85.7% and could prevent it as many as 66.7%.

**Table 2** Difference in Constipation (pretest and posttest) in the Intervention Group (n = 17) and Control Group (n = 22)

| Group        | Bowel score  |                 |              |                 | n  | p     |
|--------------|--------------|-----------------|--------------|-----------------|----|-------|
|              | Pretest      |                 | Posttest     |                 |    |       |
|              | Constipation | No constipation | Constipation | No constipation |    |       |
| Intervention | 0            | 9               | 1            | 8               | 9  | .375  |
|              | 8            | 0               | 4            | 4               | 8  |       |
|              | Total        |                 |              |                 | 17 |       |
| Control      | 0            | 15              | 5            | 10              | 15 | >.999 |
|              | 7            | 0               | 1            | 6               | 7  |       |
|              | Total        |                 |              |                 | 22 |       |

Constipation (score  $\leq 3$ ), no constipation (score  $> 3$ )

**Difference in the effect of two turning regimens for 5 days on constipation**

**Table 3** Difference in the effect of two turning regimens on constipation (N=39)

|              | Bowel score (posttest) |      |              |      | p (Fisher's exact test) |
|--------------|------------------------|------|--------------|------|-------------------------|
|              | No Constipation        |      | Constipation |      |                         |
|              | n                      | %    | n            | %    |                         |
| Intervention | 12                     | 42.9 | 5            | 45.5 | > .999                  |
| Control      | 16                     | 57.1 | 6            | 54.5 |                         |
| Total        | 28                     | 100  | 10           | 100  |                         |

The result of Fisher's Exact test between two groups showed p-value of 1.000 ( $>0.05$ ), which indicated that there was no statistical difference between the intervention and control group (Table 3). The turning regimen either every one hour or two hours could prevent the constipation in the patients with stroke and immobility.

**DISCUSSIONS**

The result of this study showed that there was no statistical difference in the constipation occurrence between two turning regimen groups. It indicates that the need for defecation for patients with stroke was still fulfilled, which was treated with turning position every one hour or two hours. However, findings also showed that 11 patients still had constipation in both treatment group (27.8%) and control group (27.3%), which indicated that the prevention of constipation was not enough if only performed by turning. That could be another reason or factor to understand this condition.

According to literature, the other factors that may influence the incidence of constipation such as age, duration of immobility, type of stroke, turning time, and type of diet, which could be explained for our study.

**Age.** The characteristics of respondents were dominated by age group of  $\geq 60$  years in both treatment group (70.6%) and the control group (86.4%). The results of the bowel score after 5 days of turning showed that 5 patients in treatment group (4 patients aged  $\geq 60$  years and 1 patient aged  $<60$  years), and 6 patients (aged  $\geq 60$  years) in control group still had constipation. There was a controversy of evidence related to the effect of age on changes in colon motility and myoelectric activity, which affected the incidence of constipation. The evidence showed that there is a normal function of defecation in most healthy elderly (Gallagher & O'mahony, 2009). However, the basic pathophysiology of intestine motility change is still unknown (Camara-Lemarroy et al., 2014). In general, constipation in the elderly can be caused by two things, namely primary (idiopathic or functional) or secondary (iatrogenic or caused by concomitant diseases) (Gallagher & O'mahony, 2009).

**Duration of immobility.** The incidence of constipation on day 1-3 of hospitalisation was 47.1% for the treatment group and 31.8% for the control group. The previous studies showed that the incidence of constipation in patients with stroke between 30-60% occurred after 4 weeks post stroke, 3 patients experienced on the third day post stroke (Su et al., 2009). This was probably caused by the duration of immobility in patients with stroke due to paralysis and or altered level of consciousness. The results showed that immobility for a long time could cause functional constipation in normal humans (Iovino et al., 2013), but it had not been studied in stroke. The immobility causes a decrease in the colon motility due to the lack of High Amplitude Propagated Contraction (HAPCs) in the colon. The reduction in the colon motility could prolong the feces transit time in the colon and lead to a reabsorption of the water content of the feces mass so that the feces become dry, hard, and difficult to be excreted in the defecation process (Potter et al., 2013; Yasmara et al., 2013).

**Type of stroke.** Posttest results showed that more constipation occurred in ischemic strokes, (23.5% in the treatment group and 22.7% in the control group) compared with hemorrhagic strokes (2.56% in the treatment group and 2.56% in the control group). However, there are no research results that could explain the effect of the type of stroke on the incidence of constipation.

**Turning time.** Turning was carried out in the first 24-72 hours after admission (day 1 = 58.9%; day 2 = 30.8%; day 3 = 10.3%) for 5 days. Early mobilization in bed with turning was recommended for bedridden patients to prevent constipation (Iovino et al., 2013) because mobility or activity could stimulate the peristaltic movement, strengthen the abdominal muscle, and ease the elimination (Lemone & Burke, 2011). However, there is no specific recommendation for an appropriate interval or time of turning to prevent constipation in patients with stroke. However, literature is more likely to reveal that turning to the right and left every two hours could increase the peristaltic movement and rectal toucher in the patients with infarct stroke (Prastya (2013).

**Diet.** Diet modification combined with pharmacological therapy as laxative is common therapy given to deal with constipation in the elderly who suffer from stroke. The study showed that high

fiber diet could not prevent or overcome constipation completely because it only forms feces without increasing the peristaltic movement of the intestine (Sturtzel & Elmadfa, 2008). In our study, the diet type undertaken by the patients in the hospital was different and it could not be controlled due to the difference in the various clinical condition of every patient. For instance, some respondents were given a liquid diet without milk and/or with milk due to the use of NGT, while some others were given per oral diets such as smooth porridge, thick porridge, rice porridge, and rice without considering the fiber intake. These differences could affect the feces consistency and the result of bowel score measurement.

The implication of our study was that the turning regimen every 1 hour or 2 hours could be performed as early as possible to prevent or overcome constipation in patients with stroke who experienced immobilization due to paralysis and/or altered level of consciousness before providing pharmacological therapy.

#### Limitations of the study

The type of diet of the patients could not be uniformed. The diet type was given to the patients was suited to the consciousness level and the clinical condition so that it could affect the feces consistency and the result of bowel score measurement. Moreover, the sample criteria could not be homogenized before the treatment based on the bowel score due to limited samples. The overall number of samples in this study was small and the sampling technique was non-random. Thus, it is less strong for generalization to the population. In addition, the researchers did not compare with participants that had never been turned due to ethical consideration. Moreover, tools used to measure bowel score was subjective. Consequently, the bowel posttest score could not be clearly identified whether it was influenced by turning or other factors.

#### CONCLUSION

The turning regimen either every one hour or two hours could prevent and overcome constipation in the patients with stroke without diet modification. However, there is a need to perform a further study with bigger samples size and with more accurate tools, and RCT design to have a stronger result for generalization to the population.

#### Declaration of Conflicting Interest

This article is a part of thesis in Master program in nursing of Faculty of Nursing Universitas Airlangga in 2018. We declared that we have no conflict of interest.

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#### Authors Contributions

NH: collected data, and drafted the article. TS: The 1st academic advisor who gave correction in the article especially in methods including

statistical test and procedure of data collection. PP: The 2nd academic advisor who analyzed and drafted the article.

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