Prolonged bed rest duration after percutaneous coronary intervention

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ESPAÑOL

Reposo en cama prolongado después de una intervención coronaria percutánea

Palabras clave

Ambulación temprana, confort del paciente, duración del reposo en cama, intervención coronaria percutánea

Resumen

- La intervención coronaria percutánea (ICP) es un procedimiento común; no obstante, no hay consenso acerca de la duración del reposo en cama después del procedimiento.
- No permitir cambios de posición durante el reposo, tanto como el prolongado reposo en cama después de una ICP causa disconfort físico a los pacientes.
- Cambiar de posición durante el reposo, elevar la cabecera a 45°, reducir el reposo en cama de 4 a 6 horas en el cuidado post ICP se encontró seguro en varios estudios.
- La mayoría de los estudios se realizaron en países occidentales con escasos pacientes Chinos. Se sugiere realizar más estudios en diferentes grupos étnicos de modo de identificar la relevancia cultural del cuidado.

SUMMARY

- Percutaneous coronary intervention (PCI) is a common procedure; however, there is no consensus about the duration of bed rest after the procedure.
- To not allow patients to change positions during bed rest and prolonged bed rest after PCI can cause physical discomfort to patients.
- Changing position during bed rest, elevating the head of bed to 45 degrees, reducing bed rest duration to four to six hours in post PCI care are found to be safe in various studies.
- Most studies are in Western countries with a limited number on Chinese patients. More studies on different ethnic groups are suggested so that culturally relevant care can be provided.

INTRODUCTION

Heart disease is the second leading cause of death in Hong Kong with coronary heart disease (CHD) being the dominant component (Centre for Health Protection, 2008). Percutaneous coronary intervention (PCI) with or without stent placement is a less invasive approach than coronary artery bypass graft surgery (Reynolds et al., 2001), commonly used to treat patients with CHD (Walker et al., 2008). During PCI, the cardiologist inserts a balloon catheter percutaneously into either the femoral, radial, brachial (Reynolds et al., 2001), or ulnar artery (Aptecar et al., 2006). Because the femoral approach permits larger catheters to accommodate special devices and requires less technical proficiency (Brodie & Mann 2004), it remains a common insertion approach.

Patients undergoing PCI are often given anti-platelet therapy before and after PCI, as well as heparin during the procedure. Thus, they are often viewed as being in a greater risk of developing vascular complications such as haematoma, pseudoaneurysm, and bleeding at the puncture site (Dumont et al., 2006; Steffenino et al, 2006) than those patients undergoing coronary angiography only. In order to prevent bleeding from the groin puncture site, patients are restricted to bed rest and told to keep the affected limb straight (Lundèn et al., 2006).

The Nursing Interventions Classifications (NIC) defines bed rest care as the promotion of comfort and safety, and the prevention of complications for a patient unable to get out of bed (Bulechek et al., 2008). On one hand, nurses want to prevent vascular complications for patients who underwent PCI; on the other hand, they need to promote comfort to patients who are restricted to bed rest. Although PCI is a common interventional procedure, there is yet no consensus about how long patients should remain under bed rest after sheath removal (Reynolds et al., 2001). Therefore, it is an area that deserves attention and further examination especially from nurses because they play an important role in ensuring that patient care is evidence-based and cost-effective (Tagney & Lackie, 2005).

This paper discusses the strengths and weaknesses of existing bed rest duration protocols being implemented for patients undergoing PCI in the first author's cardiac unit. In addition, the paper reviews current literature that examines various bed rest duration protocols and alternative activities to promote patient comfort for post-PCI patients. The implications for nursing research and practice are discussed.

Current practice

In the first author's unit, patients undergoing PCI are transferred to the coronary care unit (CCU) for close monitoring. Removal of the femoral sheath is done by the medical staff until the activated

clotting time (ACT) level is less than 150 seconds. Haemostasis is achieved by a mechanical C-Clamp followed by sandbag application. Patients are then restricted to bed rest for at least 8 to 12 hours at the post-sheath removal period and will be asked to keep the affected leg straight at all times. The head-of-bed may be elevated to no more than 30 degrees to facilitate eating. However, there is no specified routine turning of patients to the sides during bed rest. Patients will remain on bed rest overnight in CCU and their groin wounds will be assessed by doctors the next morning.

When the patient's conditions is stable, they are then transferred to the general ward via stretchers. Some nurses in the general ward tend to keep patients in bed rest for a few more hours for observation to facilitate the traffic of patients in the CCU. Consequently, taking into account the time for activated clotting to reach a safe level, the availability of the medical staff for sheath removal, the 8 to 12 hours post-sheath removal bed resting, and the waiting time for transfer to the general ward, the post-PCI patients often have extended periods of bed rest, which may be up to 24 hours or more.

Strength and weaknesses of current practice

The practice of prolonged bed rest was believed to be necessary to ensure adequate haemostasis at the femoral puncture site after the coronary diagnostic and interventional procedures (Fowlow et al., 1995; Vlasic, 2004). Owing to the greater amount of anticoagulant often used during PCI, there is a consensus in the first author's unit that patients need to remain in bed rest for long periods of time (12 to 24 hours) in order to prevent bleeding and haematoma formation at the puncture site. Therefore, extended bed rest duration may be considered as a positive development for preventing vascular complications, which often result in longer hospitalisation. However, the practice of prolonged bed rest is often based on ritual and expert opinion rather than research evidence (Vlasic, 2004).

Several weaknesses are associated with prolonged bed rest, and one of them is physical discomfort. Back pain is a major and universal problem resulting from prolonged bed rest after coronary procedures as reported by both qualitative (Gulanick et al., 1997; Lundèn et al., 2006) and quantitative (Fowlow et al., 1995; Chair et al., 2003) studies among Western and Asian patients (Chair et al., 2003). As reported by Lundèn et al. (2006), most patients experienced back pain whether they had a history of back pain or not. The severity of back pain was related to bed rest duration with the pain increasing with longer bed rest durations (Chair et al., 2003). Other discomforts such as cold hands and feet, numbness due to insufficient circulation resulting from immobilisation have also been reported (Lundèn et al., 2006). Difficulty with urination is also another common problem encountered. Most patients are not used to using the urinal or bedpan. As reported in a local study conducted by Chair et al. (2007), patients with 12 to 24 hours of bed rest experienced higher levels of urinary discomfort (p = 0.006) than those who were able to ambulate after four hours of bed rest. As personally witnessed in the clinical setting, urinary problems are more profound among male patients suffering from benign prostatic hypertrophy.

Besides causing physical discomfort, prolonged bed rest also provokes emotional or psychological disturbance among patients. Gulanick et al. (1997) conducted a qualitative study on 45 patients who underwent angioplasty. Negative themes such as anger over unmet needs for comfort or support, feeling dehumanised, and frustration over lack of control in decision making were reported. Reflecting on personal clinical experiences, these negative feelings from patients may be related to prolonged bed rest after coronary procedures. Another qualitative study conducted by Lundèn et al. (2006) on patients who underwent angiography and/or PCI echoed the findings from Gulanick et al. (1997). It was found that patients were frustrated over not being able to move freely and felt embarrassed by having to depend on someone else for personal needs such as going to the toilet (Lunden et al, 2006). In fact, patients have to depend on others for many physical needs such as eating, personal hygiene, getting blankets to stay warm, and other needs during bed resting. The situation of being dependent can be difficult especially for those who have always been able to take care of themselves (Lundèn et al., 2006).

Physical discomfort and increased dependence resulting from prolonged bed rest may actually increase nurses' workload. Back pain and body aches result in increased need for analgesic, as well as attention from nurses (Vlasic et al., 2001). In the first author's unit, if patients are unable to urinate after more than eight hours after the PCI procedure, a bladder scan may be needed to check for urinary retention. In many cases, urinary catheterisation is required, which further increases the patient's discomfort and hospital cost.

Both research findings and clinical experiences indicate that prolonged bed rest may cause more harm than benefit. In order to promote patient comfort and well-being, the safety and feasibility of reduced bed rest duration after PCI and alternative interventions had been tested and a review of literature is presented as follows.

REDUCED BED REST AND ALTERNATIVE INTERVENTIONS

Fowlow et al. (1995) conducted a quasi-experimental study with a small convenience sample of 85 patients undergoing elective PCI with 7.5 to 9 French (Fr) catheters. No significant differences in haematoma and puncture site bleeding were found between the six-hour bed rest post-sheath removal group and the eight-hour group; however, a reduction in the perception of pain had been found in the six-hour group at eight and ten hours after the procedure. Confounding variables such as heparin usage, previous history of back pain, catheter size, and the time between the last dose of heparin and sheath removal were controlled as covariates. Subject exclusion criteria, data collection procedure, vascular complications, and pain assessment tools and data analysis methods were clearly explained in this study. Inter-rater reliability of the haematoma and bleeding tendency assessment instruments were established; however, the results were not mentioned. Likewise, the validity and reliability of the instruments developed by the researchers were questionable.

The safety and feasibility of further reducing bed rest to two hours post sheath removal was tested in a randomised controlled trial conducted by Vlasic et al. (2001) with a fairly large sample size of 299 patients who underwent angioplasty with a median of 7 Fr catheters. No increased risk of haematoma formation and bleeding at the groin site following sheath removal was found in the two-hour bed rest group (n = 99) compared to the four-hour (n = 99) and six-hour (n = 101) groups. The method of randomisation and data analysis were indicated with clear inclusion and exclusion criteria. The bed rest protocol involved elevation of the head-of-bed to 30 degrees for the first hour then turning to sides for the rest of the bed rest period for all three groups. It is not known how, and how frequently, patients were being turned to the side. The combination of head-of-bed elevation, side turning, and early ambulation after the procedure makes it hard to interpret the corresponding effect of the individual protocol on vascular complications. It was reported that patients anecdotally described increased comfort with earlier ambulation. However, the method of comfort assessment and vascular complications assessment methods were not explained by the author. Patients were given enough heparin to achieve an ACT of 300 seconds but the amount of heparin given to patients was not reported.

Tagney and Lackie (2005) conducted a quasi-experimental study on 371 patients undergoing both coronary angiography and PCI. Despite the fairly large sample size, only 88 patients underwent PCI. The protocol for the six-hour group (n = 45) consisted of two hours of lying flat and four hours (n = 43) sitting with the head of bed at 45 degrees, while for the three-hour group, the protocol consisted of one

hour lying flat and two hours of sitting. No statistical insignificance (p = 0.333) on bleeding incidents was found between three-hour group and six-hour group. Furthermore, fewer haematoma occurrences were reported in the three-hour group. In this study, 6 Fr catheters were used in the majority of the patients and both arterial closure device and manual compression were used to achieve haemostasis although the amount of heparin used and the duration of bed rest with sheath in situ were not reported. These factors, together with different catheter sizes and haemostasis methods could possibly be confounding variables to the occurrence of complications because these were not controlled in this study.

Recently, another quasi-experimental study with a fairly large sample of 306 patients undergoing PCI with 6 or 7 Fr catheters was conducted by Walker et al. (2008). The study aimed to compare the complications with mobilisation at three, four, and six hours post-femoral sheath removal periods. The length of time of the bed rest was found to have no significant effect on bleeding and haematoma formation at the groin site among the three groups. Exclusion criteria, method of randomisation, data collection procedure, inter-reliability for bleeding and haematoma assessment, and the data analysis method were clearly explained by the author. In addition, the definition of haematoma was provided. However, the definition of bleeding occurrence and methods for wound complications assessment were unclear. Possible confounding variables such as pre-procedural administration of anticoagulation, anti-platelet therapy, and waiting time before sheath removal were described, but whether there was a significant difference observed among the groups on these variables was not explained in the study.

The effect of reduced bed rest has also been tested on Chinese patients undergoing cardiac catheterisation. Chair et al. (2007) conducted a randomised controlled study on post-transfemoral cardiac catheterisation with a small sample of 86 patients. No significant difference on vascular complications was found between the four-hour ambulation group and the control group (ambulation at 12 to 24 hours). Significantly, less back pain and urinary discomfort were reported in the experimental group (Chair et al., 2007). The method of randomisation, definitions of vascular complications, outcomes assessments, and data analysis were clearly explained. The test-retest reliability of the urinary discomfort measurement, which was developed by the researcher, showed a high correlation (r = 0.95). The amount of heparin given during the procedure is not known because it was not indicated in the study.

Many studies focus on reducing bed rest duration during the post-coronary procedures in an attempt to promote patient's comfort. Among the studies reviewed, some studies such as those conducted by Vlasic et al. (2001) and Tagney and Lackie (2005) actually involved alternative interventions such as elevation of the head-of-bed and changing the patient's position during bed rest. The effect of changing position has been further examined by Chair et al. (2003) in a randomised controlled study with fairly large sample size of 419 Chinese patients undergoing cardiac catheterisation. No significant difference in the puncture site bleeding was found between the experimental group (alternated supine position with side-lying during bed rest) and control group (lying supine only), however, a significant less back pain observation was established in the experimental group. The inclusion and exclusion criteria, data collection procedure, methods of outcome measurements, together with their validity and reliability, data analysis methods, and study limitations were clearly indicated. Possible confounding variables were tested for the difference between the two groups although whether or not heparin was being used during the procedure had not been mentioned.

IMPLICATIONS FOR RESEARCH

All of the studies reviewed are either randomised controlled or quasi-experimental studies. As such, they are considered powerful designs for testing the effects of specific interventions and nursing actions (Polit & Beck, 2004). However, most of the studies involved a small sample size and focused mainly on the Western population. This limits the cultural relevancy of the research findings to other ethnic groups. The two experimental studies, on the other hand, focused on Chinese patients undergoing cardiac catheterisation only, which limited their generalisability to patients undergoing PCI.

Replication studies with large sample sizes of patients undergoing PCI on different ethnics are needed to produce culturally relevant research findings. All the studies attempted to control the influence of extraneous variables such as catheter size, amount of heparin used during procedure, haemostasis method, bed rest duration with femoral sheath in situ, history of back pain, and positioning of patients during bed rest. However, not all of these confounding variables were effectively controlled in each study. Future studies should control such confounding variables so that their unwarranted influences on the effect of reduced bed rest duration can be eliminated. In addition, most of the haematoma and bleeding measurements were developed by the researchers and lacked vigorous testing for validity and reliability. Further research on the development of valid and reliable vascular complications assessment tools is needed.

With earlier ambulation after PCI, nursing time spent for attending to patient's physical needs can possibly be reduced (Chair et al., 2007; Walker et al., 2008). Further research can explore the reduction of nursing workload and hospital cost associated with early ambulation post-coronary procedures. This way, the practice of early ambulation after coronary procedures can be supported by research evidence and by cost-effectiveness.

IMPLICATIONS FOR PRACTICE

Research evidence suggests that it is feasible to reduce the bed rest duration of patients who undergo post-transfemoral sheath removal after PCI to enhance comfort without increasing the vascular complications at the groin wound site. Various hours of bed rest duration have been tested, but there has been no consensus for the minimal hours required for bed rest. Ambulation at the six-hour post sheath removal period has been the most commonly tested among the studies. Inasmuch as the tests considered it a safe option, it could be introduced into the routine practice. Given that the patients' conditions are stable, discretion should be made to allow early ambulation especially when patients are suffering from severe back pain and urinary discomfort.

Patients should be allowed to ambulate as soon as possible once they have been transferred to the general ward. However, some nurses may feel discomfort in doing so because they feel liable for any complications resulting from this change of practice. Thus, until there is a change in the unit's protocol, the movement towards early ambulation can still be a challenge. As pointed out by Ciliska (2006), there is still a considerable gap between research evidence and what happens in practice. In the mean time, the best alternative to promote patient's comfort after coronary interventions would be to encourage side-lying during the period of bed rest as suggested by Chair et al. (2003) because it can be easily incorporated into routine care and may be more acceptable to the members of the staff.

CONCLUSIONS

The current practice of prolonged bed rest for post-PCI cases poses more disadvantages than advantages to both patients and nurses. Research evidence shows that reduced bed rest duration is safe and feasible without increasing wound complications. Most importantly, it can increase patient comfort and well-being. More research is needed to further examine the effect of early ambulation in post-PCI situations; while substantial efforts are needed to promote evidence-based practice across institutions.

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