

A Prospective Study of Nurse and Patient Education on Compliance with Sequential Compression Devices

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Sequential compression devices (SCD) have become the most common form of prophylaxis against the formation of deep venous thrombosis (DVT) among surgical patients. However, compliance with SCD has traditionally been poor. The aim of this study was to assess the affect of patient and nurse education by surgeons on SCD compliance. This was a prospective study involving a single teaching hospital. Compliance was checked twice daily. The main outcomes were compliance rates with SCD use before and after nurse and patient education. Nurses were not aware of the study. Surgical floors had a history of resident and attending interactions regarding SCD, whereas nonsurgical floors did not. A handout that emphasized SCD importance was also given to patients on surgical units. Before education, surgical units had a compliance rate of 61.5 per cent, whereas nonsurgical units had a 48 per cent compliance rate. This difference was significant ($P = 0.014$). After nursing and patient education on the busiest surgical floor, compliance rates on the surgical ward increased to 65 per cent, a difference that was not of statistical significance ($P = 0.515$). A nursing unit's daily experience is the most important factor in their compliance rates with SCD use. Focused nursing lectures and patient education may have incremental value.

DEEP VEIN THROMBOSIS (DVT) and associated venous thromboembolic (VTE) events are estimated to occur with an annual incidence of 117 cases per 100,000 people in the general population.¹ DVT and VTE are common problems among hospitalized patients, with most patients having one or more risk factors for the development of a DVT.² Without any form of prophylaxis, it has been estimated that up to 40 per cent to 60 per cent of hospitalized patients would develop DVT.³ In addition to pulmonary emboli, which have considerable morbidity and mortality,⁴ up to 20 per cent of patients can develop subacute and chronic complications of DVT that can have crippling effects on mobility and quality of life.⁵ Sequential compression devices (SCD) have become the most common form of prophylaxis against the formation of DVT in hospitals. Their ease of use and safety profile makes them appropriate for most patients. They are particularly attractive in surgical patients in whom

concerns about bleeding complications after surgery or trauma often prevent the additional use of heparin or antiplatelet agents.⁶ Therefore, in surgical patients in particular, compliance with the use of SCD has special importance. However, in practice, compliance with their prescribed use has been disappointing. In a prospective study by Comerota et al.,⁷ the compliance rates of SCD use was only 48 per cent on the ward, whereas compliance in the intensive care unit (ICU) was 78 per cent. Additionally, patients who were transferred from the ICU to the ward had a decrease in compliance from 82 per cent to 33 per cent.

To assess compliance of SCD use in our hospital, we designed a study observing the rate of compliance of proper SCD use. We then studied nurse and patient education as possible solutions to improve SCD compliance rates.

Methods

This was a prospective observational study within a single community teaching hospital. The period of observation for each patient began from admission until discharge. All patients admitted to the surgical service who had SCD ordered were included in this study. All units where surgical patients were admitted, including the ICU, were studied. None of the patients or nurses

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was made aware of the study so as not to influence the outcome. Resident surgical rounds were made on all patients once in the morning and once in the evening. On rounds, flow sheets were used to document compliance, which required that patients had pneumatic stockings attached to both legs and to the air pump, and that the pump be activated. This data was collected twice daily for a period of 2 months. Data on morning and afternoon rounds for each patient was counted as separate patient entries to evaluate the different nursing shifts taking care of each patient.

After this initial observational period, a single surgical resident conducted an educational meeting with the nursing staff of the busiest surgical floor in the hospital. This involved a group discussion with nurses on day and evening shifts. An explanation of the purpose and benefits of SCD was given to all nurses on the unit, followed by a question and answer period. Additionally, one-page informational fliers (Fig. 1) were created by the investigator and handed to each patient on this surgical floor, requesting that the patients replace their own SCD after ambulation or else notify a nurse to do so.

After the educational meetings and use of patient information handouts, a 2-month period of observation was undertaken just as before, with the exception that only the busiest surgical floor had been educated about SCD. Data sheets were collected as before, looking at the same parameters.

Results

At the end of the first period of observation (pre-education), compliance rates were calculated. The surgical floor had a significantly higher compliance rate (131/213; 61.5%) than the nonsurgical floors (73/152; 48%), which was statistically significant ($P = 0.014$) based on a Fisher's exact test. After nursing and patient education, the surgical floor experienced an even higher compliance rate (93/142; 65%) compared with the nonsurgical units, which had not undergone education (73/152; 48%). This difference was also significant ($P = 0.004$). Comparisons of compliance rates on

the surgical floor before and after nurse and patient education did reveal a small improvement in compliance, but this was not of statistical significance ($P = 0.515$).

Discussion

Pneumatic compression devices are frequently ordered for general surgical and trauma patients. They are currently the safest and least invasive intervention available that may help reduce the incidence of DVT. However, the effectiveness of SCD is limited by poor compliance rates. Poor compliance may be related to several factors. One factor may be that nurses, patients, and physicians may not appreciate their importance. Periodic education among nurses and house staff might prevent this problem, as might audits of SCD compliance performed by physicians and nurses. Creating an environment where routine SCD use with full compliance is the standard of care for an institution may be the best strategy for improvement. Another factor involved is that although nurses are required to log the name and dosage of medications that are administered to patients, no such system exists among nurses for documenting the use of SCD. Hence, there is no accountability for compliance with SCD orders. A similar system for noting the use of SCD could be instituted so that it becomes a part of the nursing checklist as well as sign out between nursing shifts. On a similar note, the use of SCD could be included in each progress note by physicians to increase awareness of compliance.

A third factor that is demonstrated in this study is that not all nursing units are equal and interchangeable. With nursing and bed shortages, surgical patients are often admitted to units less accustomed to dealing with surgical patients. On many of these floors, SCD are less frequently ordered by physicians who routinely admit patients to that unit, which may result in nurses being less likely to notice when SCD are not ordered or in working condition. Our data suggests that compliance rates have more to do with nursing experience than with structured lectures. Frequent dialogue and education between nurses and physicians may be a part of the solution and in fact did have incremental value in this study. The nursing unit with the most experience in dealing with SCD had the best compliance rates, which were improved even further with education. The nurses who were more accustomed to making SCD compliance a part of their nursing duty each day demonstrated better compliance; this appears to have habituated the nursing staff more effectively than lectures, and is thus a more effective form of education and training.

Patient education in our experience did not increase compliance rates significantly. Despite having a flier

***Please notify your nurse if your
compression stockings are not on. They are
important for preventing blood clots during
your hospital stay.***

FIG. 1. Informational flier handed to patients with SCD.

that served as a constant reminder of the importance of SCD use, there was only an insignificant increase in SCD use. It is likely that improvement with SCD compliance will be primarily driven by physicians and nurses.

Conclusion

SCD compliance rates directly affect their potential efficacy. Compliance rates are most affected by the collective experience a nursing unit has with using SCD on a daily basis. Specific educational tools may be of only incremental value. Compliance will be best when patients are admitted to the units most experienced in dealing with their specific care issues.

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