Scheduled replacement of peripheral venous catheters has no advantage over replacement on clinical indications

Summary

Replacing peripheral venous catheters at scheduled intervals[1] has shown no advantage over replacement when clinically indicated. Replacement on clinical indications means not only fewer interventions and hence less discomfort for the patient, but also a cost saving.

[1] *Between 72 and 96 hours.*

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Peripheral venous catheters and complications

Peripheral venous catheters (PVC) are commonly used in healthcare to administer fluids, nutrition, blood components or drugs directly into the bloodstream. A PVC is a narrow catheter which is inserted into a blood vessel with the help of a cannula, most frequently into a vein on the back of the hand or in the arm. Inserting and replacing the catheter is associated with a certain amount of pain for the patient [1].

Thrombophlebitis (simultaneous inflammation and embolus in the superficial venous system) is the most common complication associated with the use of PVCs in adults. Thrombophlebitis is characterised by pain, erythema, heat, swelling and a palpable venous cord, which leads to varying degrees of discomfort for the patient. Other more serious, but rarer, complications are bacterial infections or the successive enlargement of a superficial embolus which infiltrates the deep venous system [1].

Scheduled replacement of peripheral venous catheters has not been shown to be more effective than replacement on clinical indications

SBU has summarised and commented on a Cochrane report from 2010 [2]. The Cochrane report concluded that there is no decisive benefit in replacing PVCs at predetermined times. The studies on which the report is based showed no statistically significant differences in the number of cases of thromboplebitis, bacteraemia, local infections or infiltrations in patients with venous catheters which were replaced on clinical indications compared with those whose catheters were replaced at predetermined intervals. However, catheters became occluded more frequently in the group in which PVCs were replaced on clinical indications (statistically significant difference between the groups). In the Cochrane report, the occlusion of catheters is not regarded as a clinically important endpoint, as it is only an indication that the catheter needs to be changed.

Patients with PVCs who received parenteral nutrition were not included in the Cochrane report. For more information, please read SBU's comments [1].

Replacement of PVCs on clinical indications can lead to reduced costs

The average cost of one PVC is SEK 8. The county councils' annual purchasing costs for PVCs is estimated at around SEK 40 million (calculation based on Stockholm County Council's costs of SEK 8.8 million) [1].

According to one of the studies in the Cochrane review, the number of interventions could be reduced

by 9.3 per cent[2] if the catheters were replaced on clinical indications instead of scheduled replacement every 72 hours [3]. If an equivalent reduction in the number of interventions could be achieved in the Swedish healthcare system without compromising the quality of care, the reduction in costs would be about SEK 3.7 million (9.3% × SEK 40 million), on condition that in all instances, hospital routines were altered from scheduled to clinically indicated replacement.

If the routines were changed from predetermined replacement every 72 hours to clinically indicated replacement, the reduction in cost would be:

County council's cost (SEK) = (Number of PVCs used in the county council for scheduled replacement) × 9.3 per cent × SEK 8

In conjunction with the insertion of a PVC, clinical observations are also recorded, e.g. the patient's general condition. In this context, the potential saving in time associated with replacing the catheter on clinical indications is irrelevant, as the requirement for regular observations of the patient at frequent intervals remains as high as when catheters are replaced at regular intervals.

Less pain for the patient, but the requirement for frequent, regular surveillance remains

Replacing PCVs when clinically indicated could reduce patient discomfort associated with frequent needlesticks. However, when replacement is no longer scheduled at predetermined intervals, frequent, regular surveillance is nonetheless essential, in order to enable early detection of complications and detection of an old catheter that needs to be changed.

[2] *749 PVCs in the group with regular changes every 72 hours and 679 PVCs in the group with changes when clinically indicated.*

References

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3. Webster J, Clarke S, Paterson D, Hutton A, van Dyke S, Gale C, et al. Routine care of peripheral intravenous catheters versus clinically indicated replacement: randomised controlled trial. BMJ 2008;337:a339.

Project group

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