Incidence, Risk Factors and Prevention Related to Infusion Phlebitis

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Abstract

Phlebitis linked with peripheral venous catheters is caused by inflammation of the vein at the cannula access site. It could be caused by mechanical, chemical, or pathogenic agents. Phlebitis can be avoided by adhering to best practices when inserting a cannula, such as selecting the right device and placement. Document the incidence of phlebitis and explore the risk factors linked with it. Analysis of existing data from a major randomised controlled trial. The primary goal of which was to compare routine peripheral intravascular catheter replacements with catheter replacements based solely on clinical indication. Patients hospitalised to the medicine and surgery ward, which required an intravenous catheter in the periphery were the part of study. 13283 PIVCs were investigated. During intravenous infusion, 41 (0.1%), and 48 hours after chemotherapy infusion, 35 (1.3%), paediatric patients were diagnosed with phlebitis. Postinfusion phlebitis can be problematic; therefore, it is essential for medical professionals to inform patients of what to watch for after the removal of an intravascular device.

Keywords: Phlebitis, Intravenous, Infection, Hospital.

INTRODUCTION

Peripheral intravascular catheterization (PIVC) is a prevalent aspect of acute hospitalisation, with the majority of patients requiring intravenous fluid or medicine administration at some point during their hospital stay [1,2]. Among the complications of PIVC is phlebitis, which is identified by the presence of discomfort, soreness, swelling, induration, erythema, and a cord-like vein [3]. Several factors have been linked to the development of phlebitis, including: (1) chemical factors—caused by irritant drugs or infusates; (2) mechanical factors—size, location, catheter material, and skill of the inserter; (3) infection factors—migration of organisms from the skin, along the catheter to the tip or to a contaminated hub; and (4) patient factors—infection at another site, age, and gender [4]. Regardless of the underlying reason, phlebitis can lengthen a patient's hospital stay, increase treatment expenditures, and in rare situations result in bacteremia [5].

When the catheter is withdrawn, the majority of cases of phlebitis are mild and resolve without treatment. However, published rates are typically predicated on phlebitis happening during intravenous therapy, but phlebitis is an inflammatory response that can occur long after the device has been withdrawn [6]. Phlebitis impairs future venous access [7], and untreated bacterial phlebitis can lead to bloodstream infection [8]; hence, early detection of problems and removal of the PIVC are essential.

Phlebitis may be confined to the place of insertion or may spread along the vein. If extravasation (also known as infiltration) of fluids into the interstitial space occurs [9], oedema may hamper the detection of phlebitis symptoms, such as induration (tissue hardening), due to the inability to palpate the vein. Phlebitis can develop during catheterization or up to 48 hours following catheter removal [10].
Material and Method

A randomized controlled study was done among routine intravenous catheter removal and replacement when clinically required. Briefly, 13283 adult and paediatric patients who were admitted to medicine or surgical wards and requiring a peripheral intravenous catheter for a minimum of four days were eligible. Exclusion criteria included bloodstream infection and planned catheter removal within 24 hours. Catheters were inserted by the hospital’s medical and nursing staff.

The catheters of patients were withdrawn only upon completion of therapy or if complications such as phlebitis, infiltration, occlusion, or inadvertent removal occurred or catheters removed and replaced every third day, unless a catheter-related problem necessitated more frequent replacement. The primary endpoint of the initial research was the occurrence of phlebitis during intravenous therapy or within 48 hours following removal. The number of observed cases of infusion phlebitis is expressed as frequencies (%) and rates (1 in n).

Results

During the study, 13283 PIVCs patients were studied. A total of 4808 (36.19%) were male, 5711 (42.99%) were female, and 2764 (20.80%) were paediatric patients admitted in medicine and surgery wards. During intravenous therapy, 41 (0.4% of adult patients) were diagnosed with phlebitis, necessitating intravenous replacement. Post-chemotherapy phlebitis at 48 hours was diagnosed in 35 (1.3%) of paediatric patients (Figure: 1).

Due to bicarb infusion, phlebitis developed in 3 (0.02%) patients and due to fragile vein, phlebitis developed in 6 (0.04%) patients (Figure: 2).
Pain and tenderness were the symptoms most frequently reported; rates of other signs and symptoms are reported in (Table: 1).

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Frequency (%)</th>
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<tbody>
<tr>
<td>Pain/tenderness</td>
<td>61 (0.45%)</td>
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<tr>
<td>Swelling</td>
<td>48 (0.36%)</td>
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<tr>
<td>Erythema</td>
<td>26 (0.19%)</td>
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Discussion

There are at least 71 distinct phlebitis scales [3]; as a result, the frequency of phlebitis varies greatly depending on the population investigated and the diagnostic criteria employed. Older studies have reported rates as high as 91% [11]; however, results from recent large trials indicate that the per catheter incidence of phlebitis in tertiary hospitals is more likely to be around 4.6% [12], which is close to the recommended target of 5% set by the Infusion Nurses Society [13]. Not all authors described phlebitis in the identical manner. Some reported the incidence of phlebitis per patient (possibly including several PIVCs), whilst others recorded the incidence per PIVC.

Commonly, phlebitis assessment scores or grades were assigned in one of two methods. Scores for phlebitis were either cumulative (points were assigned for each symptom and added) or progressive (based on more points for a specified progression of symptoms). Cumulative scales assigned 0–2 points for each symptom of phlebitis, based on the existence, measured length (in centimetres), or severity, and their total potential scores ranged from 0–6 to 0–7, to 0–9, and from 4–16. The grading of total phlebitis also varied significantly on progressive scales, ranging from 0–2 to 0–6.

Nevertheless, phlebitis can be quite painful and might take up to seven days to heal [6]. In rare instances, phlebitis may be accompanied by a bloodstream infection, a far more dangerous and sometimes fatal illness [14]. After an intravascular device has been removed, it is essential for medical personnel to inform patients of what to watch for. Importantly, patients must be instructed to report any persistent issues to a nurse or physician, or, after hospital discharge, to their primary care physician.
Conclusion

Infusion-related phlebitis is caused by multiple factors, including the infusate and the duration of cannulation. Even though postinfusion phlebitis is a rare complication of peripheral arterial catheterization, the access site should be examined for at least 48 hours after catheter removal in order to guarantee adequate therapy.

REFERENCES