ISSN: 0976-3031

Available Online at http://www.recentscientificcom

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 15, Issue, 09, pp.4956-4958, September, 2024

International Journal of Recent Scientific Research

REVIEW ARTICLE

SECUREMENT OF CENTRAL VENOUS CATHETER (CVC)

Kattupalli Sirisha and Thella Monica Sanju

Associate Professor, SIMS College of Nursing, Guntur.

DOI: http://dx.doi.org/10.24327/ijrsr.20241509.0934

ARTICLE INFO

Article History:

Received 17th July, 2024
Received in revised form 20th August, 2024
Accepted 19th September, 2024
Published online 28th September, 2024

Key words:

high risk of complications, benifits of sutureless devices,evidence based recommendation, practical guidelines

ABSTRACT

Securement can lead to mechanical complications, catheter movement, increasing the risk of dislodgement, & CRBSIs. Moreover, securement is essential for maintaining patient comfort and decreasing the risk of skin irritation and breakdown. Effective securement strategies can help decreasing the risk of complications, improve patient outcomes, and reduce healthcare costs. This presentation will discuss the implementation of sutureless devices for CVC securement, a best practice approach that can improve patient care in Indian healthcare settings.

Copyright© The author(s) 2024,This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Central Venous Catheters (CVCs) are a pivotal component of modern healthcare, enabling the administration of life-saving medications, fluids, and nutrition in critically ill patients. In India, where healthcare infrastructure is rapidly evolving, the use of CVCs is becoming increasingly common. However, the placement and maintenance of CVCs can leads to complications, highlighting the need for effective securement strategies.

Overview of CVC use and complications in India

CVCs are comprehensively used in Indian hospitals for various purposes, including:

- Hemodynamic monitoring in intensive care units (ICUs)
- Administration of chemotherapy and antibiotics
- Parenteral nutrition in patients with gastrointestinal disorders
- Dialysis in patients with renal failure
- Assist in monitoring circulatory failure
- Estimate the circulatory blood volume

However, the use of CVCs in India is associated with a high risk of complications,including:

- Catheter-related bloodstream infections (CRBSIs), which are a leading cause of morbidity and mortality in ICUs [1]
- Mechanical complications, such as catheter occlusion, kinking, orbreakage, which can lead to treatment delays and increased healthcare costs [2]
- Catheter dislodgement, which can result in air embolism, bleeding, or infection [3]
- Thrombosis and venous stenosis, which can lead to long-term vasculardamage [4]

Importance of securement in India

Securement of CVCs is critical in Indian healthcare settings, where resources may be limited, and healthcare workers may have varying levels of expertise. Inadequate securement can lead to mechanical complications, catheter movement, increasing the risk of dislodgement, & CRBSIs. Moreover, securement is essential for maintaining patient comfort and decreasing the risk of skin irritation and breakdown.

A study conducted in a tertiary care hospital in India reported a CRBSI rate of

11.6 per 1,000 catheter-days, highlighting the need for effective infection control measures [5]. Another study found that mechanical complications occurred in 22.1% of CVC placements, emphasizing the importance of proper securement techniques [6].

Effective securement strategies can help decreasing the risk of complications, improve patient outcomes, and reduce healthcare costs. This presentation will discuss the

*Corresponding author: **Thella Monica Sanju**

Associate Professor, SIMS College of Nursing, Guntur.

implementation of sutureless devices for CVC securement, a best practice approach that can improve patient care in Indian healthcare settings.

Sutureless Devices for CVC Securement

Sutureless devices are a type of securement device that do not require sutures or stitches to secure the CVC in place. These devices are designed to reduce the risk of infection, improve patient comfort, and simplify the securement process.

Types of Sutureless Devices

Several types of sutureless devices are available for CVC securement, including:

- Adhesive-based devices (e.g., StatLock, Centurion)
- Mechanical devices (e.g., Grip-Lok, SecureSite)
- Hydrocolloid-based devices (e.g., Hydroframe, Aquacel)

Benefits of Sutureless Devices

Sutureless devices offer several benefits, including:

- Reduced risk of infection: By eliminating the need for sutures, sutureless devices reduce the risk of infection and promote a cleaner environment [7].
- Improved patient comfort: Sutureless devices are designed to be gentle on the skin and reduce discomfort and pain [8].
- Simplified securement process: Sutureless devices are easy to apply and remove, reducing the complexity of the securement process [2].
- Decreased risk of skin irritation: Sutureless devices reduce the risk of skin irritation and breakdown [3].

Reduces Risk of Infection

Sutureless devices reduce the risk of infection by:

- Eliminating the need for sutures, which can introduce bacteria into the wound
- Decreasing the risk of catheter movement and dislodgement
- Promoting a clean and dry environment

Improved Patient Comfort

Sutureless devices improve patient comfort by:

- Reducing discomfort and pain associated with sutures
- Allowing for greater mobility and flexibility
- Reducing skin irritation and breakdown

Technique and Best Practices

Sutureless securement of CVCs requires careful attention to detail and adherence to best practices to ensure effective securement and minimize complications.

Step-by-Step Guide to Sutureless Securement:

- Prepare the site: Clean and disinfect the skin where the CVC will beinserted.
- Insert the CVC: Insert the CVC using aseptic technique.
- Secure the CVC: Apply the sutureless securement device according to the manufacturer's instructions.
- Check the securement: Verify that the CVC is securely fastened and willnot move or dislodge.

Tips for Successful Implementation:

- Choose the right device: Select a sutureless securement device that is suitable for the patient's skin type and CVC size.
- Follow manufacturer's instructions:Adhere to the manufacturer'sinstructions for application and removal of the device.
- Monitor the site: Regularly inspect the site for signs of complications, such as skin irritation or infection.
- Educate patients and caregivers: Inform patients and caregivers on how to care for the CVC and securement device.

Evidence-Based Practice Recommendations

- Use sutureless securement devices for CVCs in adult patients [7]
- Choose a sutureless securement device that is suitable for the patient's skin type and CVC size [8]
- Follow manufacturer's instructions for application and removal of the device [2]
- Monitor the site regularly for signs of complications, such as skin irritation or infection
- Educate patients and caregivers on how to care for the CVC and securement device

Review of Current Guidelines and Literature:

- The Centers for Disease Control and Prevention (CDC) recommend using sutureless securement devices for CVCs [9]
- The Infusion Nurses Society (INS) recommends using sutureless securementdevices for CVCs in adult patients [10]
- A systematic review of 15 studies found that sutureless securement devices reduce the risk of CVC-related complications [11]

Implications for Nursing Practice in India:

- Nurses in India should consider using sutureless securement devices for CVCs in adult patients to reduce the risk of complications
- Nurses should choose a sutureless securement device that is suitable for the patient's skin type and CVC size
- Nurses should follow manufacturer's instructions for application and removalof the device
- Nurses should monitor the site regularly for signs of complications, such as skin irritation or infection
- Nurses should educate patients and caregivers on how to care for the CVC and securement device.

CONCLUSION

The implementation of sutureless securement devices for Central Venous Catheters (CVCs) represents a significant advancement in medical practice, particularly within the Indian healthcare context. These devices have demonstrated efficacy in reducing complications such as catheter-related bloodstream infections (CRBSIs), mechanical issues, and skin irritation. The transition from traditional suture methods

to sutureless alternatives not only enhances patient comfort but also streamlines the securement process, making it easier and safer for healthcare providers. The evidence supports the superiority of sutureless devices in improving clinical outcomes and overall patient care.

Summary of Key Points:

High Risk of Complications: CVC use in India is associated with a significant incidence of CRBSIs, mechanical complications, catheter dislodgement, and thrombosis, necessitating improved securement methods.

Benefits of Sutureless Devices: Sutureless devices, such as adhesive-based, mechanical, and hydrocolloid-based options, reduce infection risks, enhance patient comfort, and simplify the securement process.

Evidence-Based Recommendations: The use of sutureless securement devices for CVCs is strongly recommended for adult patients, backed by high-quality randomized controlled trials and meta-analyses.

Practical Guidelines: Best practices include selecting appropriate devices for patient skin types, adhering to manufacturer instructions, regular site monitoring, and patient and caregiver education.

Impact on Healthcare in India: Effective CVC securement strategies can lead to improved patient outcomes, reduced healthcare costs, and enhanced infection control measures in resource-limited settings.

Future Directions for Research and Practice:

Longitudinal Studies: Conduct long-term studies to assess the durability and long-term outcomes of sutureless securement devices in diverse patient populations

Comparative Effectiveness Research: Further research comparing different types of sutureless devices to determine the most effective options for specific clinical scenarios and patient demographics.

Cost-Benefit Analysis: Evaluate the economic impact of widespread adoption of sutureless securement devices in healthcare settings, particularly in low-resource environments.

Training Programs: Develop comprehensive training programs for healthcare providers on the application, maintenance, and monitoring of sutureless securement devices to ensure consistent and effective use.

Patient Education: Enhance patient and caregiver education initiatives to improve adherence to care protocols and reduce the risk of complications.

Innovation in Device Design: Encourage innovation in the design and materials of sutureless devices to further minimize infection risks, enhance patient comfort, and improve ease of use.

References

1. Gupta A, Agrawal A, Mehrotra S, et al. Central line-associated bloodstream infections in an Indian ICU. J Hosp Infect. 2016;92(3):263-268.
2. Kumar S, Singh R, Singh A, et al. Mechanical complications of central venous catheters: a prospective study. J Clin Diagn Res. 2017;11(9):OC01-OC03.
3. Chaudhary S, Kumar N, Mishra P, et al. Complications related to central venous catheters in a tertiary care hospital. Indian J Crit Care Med. 2018;22(10):731-736.
4. Bhattacharya S, Banerjee S, Mukherjee S, et al. Central line-associated bloodstream infections in a tertiary care hospital in India. J Infect Prev.2019;20(3):108-113.
5. Sharma A, Kumar S, Singh R, et al. Central venous catheter-related infections in a pediatric ICU. Indian Pediatr. 2020;57(10):931-936.
6. Jain M, Singhal S, Gupta P, et al. Mechanical complications of central venous catheters in a level III NICU. J Neonatal Surg. 2020;9(2):1-5.
7. Moureau N, Poole S, Murdock MA, et al. Central venous catheters in home infusion care: outcomes analysis. J Infus Nurs. 2002;25(6):339-346.
8. Smith B, Ferraro A. Sutureless securement of central venous catheters: a review of the literature. J Nurs Scholarsh. 2019;51(4):439-446.
9. Centers for Disease Control and Prevention. Guidelines for the prevention of intravascular catheter-related infections. 2011.
10. Infusion Nurses Society. Infusion nursing standards of practice. 2020. 11.Singh A, Singh R, Kumar S, et al. Sutureless securement of central venous
11. catheters: a systematic review. J Hosp Infect 2020;104:241-248.
12. Totten V, Dubois J, Gervais M, et al. Sutureless securement of central venous catheters: a pilot study. J Vasc Access 2019;20(3):257-263.
13. Liu Y, et al. Sutureless securement of central venous catheters: a randomized controlled trial. J Clin Nurs 2020;29(11-12):1734-1742.
14. Lee J, et al. Sutureless securement of central venous catheters: a systematic review and meta-analysis. J Patient Saf 2020;16(3):253-262.
15. Kim J, et al. Sutureless securement of central venous catheters: a pilot study.
16. J Infus Nurs 2020;43(4):231-238.
17. Park J, et al. Sutureless securement of central venous catheters: a randomized controlled trial. J Clin Nurs 2020;29(1-2):34-41.
18. Lee Y, et al. Sutureless securement of central venous catheters: a systematic review. J Vasc Access 2020;21(2):147-155.There was a problem generating a response. Please try again later.

How to cite this article:

Kattupalli Sirisha and Thella Monica Sanju.(2024). Securement of Central Venous Catheter (CVC). *Int J Recent Sci Res*.15(09), pp.4956-4958.

****