WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Multi Component Nursing Care on Pin Site Infection among Patients with External Fixator in Ortho Wards

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ABSTRACT:

Pin site infection is the most common external fixator problem. According to the prevalence of external skeletal fixation in India, pin site infection among patients at AIIMS ranges from 4.7 percent to 71.4 percent. In compared to other studies from developed and developing nations, the incidence rate of pin site infections after external fixation for fracture is high. The multi-component nursing care for pin site infection is a collection of interventions that, when administered together, improve pin site infection outcomes.

Key words:Pin site infection, multi component nursing care, external fixator

Introduction:

Metal pins are used in external skeletal fixators. When these pins are placed into the bone through the skin, they act like foreign bodies because they are in contact with the outside world. Percutaneous pins and wires can cause a variety of orthopaedic complications. 1It was also one of the most common side effects of skeletal pins and cables. Infections can range from the superficial to the deep.[1,2]

There are three levels for pin site infection; Level one represents normal/physiologic changes in skin color, skin warmth, pin site drainage, and resolves within 72 hours; level two represents erythema, warmth, drainage, possible pain, and positive culture; level three represents all of the above, possibly with the addition of pus, pin loosening, or increased microbial growth on cultures; and level four represents all of the above, possibly with the addition of pus, pin loosening, or increased microbial growth on cultures.[3]

A combination of factors relating to patients or the external fixator may increase the risk of pin site infections.[4]

- Patient factors include
- Age
- Smoking
- Rheumatoid arthritis
- Collagen vascular diseases
- Someconsumed medications as steroids and open wound
- Multiple comorbidities
- Poor soft tissue structure
- Inadequate general hygiene

while factors related to external fixator include duration of pin fixator, operative technique and care givers.5

External fixator

External skeletal fixation is a surgical procedure that immobilizes bones to cure a fracture or correct a deformity. Pins are inserted into the bone on both sides of the fracture to accomplish this. Clamps and rods are used to anchor the pins outside of the skin. There has been an upsurge in the usage of external skeletal fixation techniques during the last decade.[6]

Stabilization of the fracture, greater patient comfort, simplicity of nursing care, free motion of the neighboring joint, reduced blood loss when used for pelvic fractures, ease of vascular, soft tissue reconstruction, and improved pulmonary function are six advantages of using an external fixator. External fixator downsides include the cost of the device, a high infection risk, delayed union or malunion, pin loosening, and joint stiffness.[7]

Nerve and vascular injury, delayed bone union, wire and pin loosening, and mechanical fixator issues are all possible side effects of this procedure.[8]

Before discharge; the nurses educate patients about signs and symptoms of infection, restrictions needed to protect the affected limb, pin site care, activity of daily living, medications and follow up visits.[9]

Elements of multi component nursing care on pin site infection:

It refers to treatment outcome by Cleansing and Dressing (Pin site care should be undertaken as often as necessary to keep the area clean, and at least once a week. [10]

Except in patients with a documented intolerance to chlorhexidine or pre-existing skin disorders such as dermatitis, chlorhexidine in alcohol solution is used to clean pin sites. Chlorhexidine should be used with caution because it has been linked to hypersensitivity, generalized allergic responses, and anaphylaxis. A 17.6% reactivity to alcoholic chlorhexidine has been observed.[11]

If irritation or hypersensitivity occurs after using chlorhexidine, try sterile saline instead. If it is contraindicated but an antimicrobial cleansing solution is required, medical and infection prevention control teams should be consulted for alternate antimicrobial solutions. , Showering, Antibiotics as a preventative measure (Deep or severe infections may necessitate consultation with a clinical microbiology team and antibiotic treatment for an extended period of time.) It's probable that a biofilm has formed and the infected pins and wires will need to be removed if the illness isn't adequately controlled with medicines. Pin site infection in patients with external fixators can be avoided with good nursing care, which includes mobility exercises, diet, and patient counseling.[12]

Supports for patient needs

External fixation patients may have complex demands and require continuing attention, especially in the early stages of treatment. The presence of an external fixator device may make regular tasks such as showering or walking more difficult. They'll also have to adjust their activities to fit their everyday routines. Patients should be able to express any worries they have about coping with the frame and managing everyday activities through open dialogues initiated by health providers. It is critical to address quality of life, depression, and anxiety as part of these dialogues.

External fixator devices can be difficult for some patients to accept due to deformity. Those who have problems accepting the device may find it challenging to engage in treatment and adhere to care guidelines. They may be anxious as a result of changes in the unpredictability of their capacity to carry out daily activities, as well as feelings and control.[13]

Nurses' role

A holistic, patient-centered approach benefits from actively including patients in treatment planning and evaluation. Appropriate multidisciplinary team involvement, both in the hospital and in the community, aids in providing patients with the skills and tools they need to self-care.

It is critical to psychologically prepare the patient for the use of the external fixator. The device appears clunky and strange. Acceptance of the device is aided by assurances that the gadget would cause minimal discomfort and that early mobility is expected.

The nurse must be on the lookout for difficulties caused by the device's pressure on the skin, nerves, or blood vessels, as well as the onset of compartment syndrome. To prevent pin tract infection, the nurse administers pin care as directed. Cleaning each pin site individually three times a day with cotton-tipped applicators soaked in sterile saline solution is common. At the pin point, no crusts should form. The nurse alerts the physician if there are signs of infection or if the pins or clamps appear to be loose.

Within the limits of tissue injury, the nurse advises isometric and active workouts. The nurse assists the patient in becoming mobile within the prescribed weight-bearing limitations (non–weight bearing to full weight bearing) once the swelling has subsided. When tension is applied to the bonepin contact, following weight-bearing recommendations reduces the possibility of pin loosening. After the soft tissue recovers, the fixator is removed. It's critical to teach the patient how to adjust the telescoping rods and how to take care of their skin. Weight bearing can usually be encouraged by the nurse. No further adjustments are performed after the required correction has been obtained, and the fixator is left in place until the bone heals.[14,15]

Also, while arranging departure from the hospital, concerns like depression and destructive behavior must be carefully examined, especially if patients are expected to manage their frame and pin sites between outpatient follow-up sessions. Additional community care and more regular follow-up may be beneficial for patients who do not adjust well after being discharged. Self-management care may aid in the development of coping techniques.[14,15]

Conclusion

External fixation devices engender complex issues that can have a negative impact on patient experience and clinical outcomes. Nurses have an important role in supporting patients throughout the treatment process, delivering effective education and supporting multi component nursing care on pin site care.

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