

A Problem Solving Approach

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CATHETER associated urinary tract infection is a nosocomial problem that can cause prolongation of hospital stay and even death. These patients may have to be treated with urinary antibiotics, which adds to the cost of care. At times the infection may be with multi-resistant bacteria, and the patient may not get cured. A problem solving approach was selected to minimise this problem in a group of selected patients. The problem was identified, analysed, solutions tried, found to be effective and, so implemented.

Identification of the Problem

Catheter associated urinary tract infection was being suggested as a problem by the staff working in the intensive cardiac care unit. A retrospective analysis of medical records revealed that it is a problem in adult open heart surgery patients. Out of the 67 charts reviewed, 59 had their urine cultures done and 14 had urinary tract infection (23.73%).

Analysis of the Existing Conditions

All the patients were pre-operatively catheterised in the operation theatre, using new Foley's catheter, under strict aseptic precautions. All of them were getting Inj. Gentamycin and Cloxacillin as prophylactic antibiotic. None of the patient's urine was tested prior to catheterisation to detect bacteriuria. For the purpose of measuring hourly urine output the closed drainage system was opened 24 times a day. Occasionally this was being done by personnel who did not have the knowledge of aseptic technique and ascending infection. Catheter care was literally absent. The technique of urine sample collection for culture was faulty.

Developing a Plan of Action

Based on the knowledge gained from literature review and advice from experts, the following solutions were planned.

1. Educating the personnel in catheter maintenance and specimen collection.
2. Sending urine sample for culture prior to catheterisation to detect bacteriuric patients.
3. Giving catheter care twice daily, using freshly prepared Savlon 1/100 and applying Neomycin ointment at the meatal catheter junction.
4. Graduating collection bottle in 10 ml divisions by sticking an elastoplast ($\frac{1}{2}'' \times 8''$) to the outside of the bottle, and graduating it upto 600 ml,

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5. Changing the collection bottle alone everyday morning with a sterile bottle.

Putting the Plan into Action

All the staff in Intensive Cardiac Care Unit were informed about the plan and got their co-operation. A protocol for care of patients with indwelling catheter, and, a procedure guideline for catheter care were prepared and given to the staff working in the unit (see Notes 2 and 3). Eleven adult open heart surgery patients (6 males and 5 females) were taken consecutively to give the planned treatment. Their age ranged from 13 to 55 with a range of 42. The various types of surgery they have undergone include intracardiac repair, coronary artery bypass graft, ASD and VSD closures, and, single and double valve replacements. The size of the Foley's catheter ranged between 10F to 16F, the mode being 14F. They were catheterised for a period of one to six days with a mean of 3.6 days.

Their midstream urine was tested to detect preop-bacteriuria. They received catheter care twice daily, while on catheter. Hourly urine output was determined without opening the bottle (by noticing the level from the graduated elastoplast). Urine was emptied from the collection bottle when it reached 600 ml. Everyday morning the collection bottle alone was changed with a sterile bottle. Urine was tested for urinary tract infection, while on catheter, and also 24 hrs after catheter removal.

Evaluation

Out of the 11 patients two were bacteriuric prior to catheterisation these two patients developed urinary tract infection, in spite of the treatment received. All the other patients remained abacteriuric 24 hrs after catheter removal also.

There is considerable saving of nursing time, since the measuring of hourly urine output was made easier by the newly graduated bottle. It was found that on an average 2-3 times only the bottle was emptied daily, which used to be 24 times previously.

Conclusion

The following practices were implemented in the care of patients having urinary catheter.

- catheter care twice daily using freshly prepared Savlon 1/100 and applying Neomycin ointment at the meatal catheter junction.
- graduating collection bottles in 10 mls.
- changing collection bottle alone everyday.

—aspirating urine from the catheter cuff, under sterile precautions, rather than disconnecting the catheter-rubber tube junction to get a sample for microbiological investigation.

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Note : 1 DEFINITION OF TERMS

Adult Open Heart Surgery Patients: Patients whose age is 12 years and above and who are operated under cardio-pulmonary bypass.

Urinary Tract Infection: The presence of a colony count $\geq 100,000/\text{ml}$ in a properly collected and processed midstream or catheter specimen of urine.

Bacteriuria: The presence of a colony count $\geq 1000/\text{ml}$ in a properly collected and processed midstream or catheter specimen of urine.

Note : 2

RECOMMENDATIONS FOR URINARY CATHETER CARE

1. Catheterize the patient only when absolutely necessary, and remove the catheter as soon as possible.
2. Use aseptic technique and equipment when inserting the catheter.
3. Secure the catheter to prevent movement and urethral traction.

4. Maintain closed sterile drainage. If frequent irrigations are necessary, use a triple lumen catheter permitting continuous irrigation within a closed system.

5. Give catheter care twice daily using Savlon 1/100.

6. Aspirate urine for culture from the catheter cuff using sterile syringe and 21-22 gauge needle. Cleanse the puncture site of catheter with spirit and betadine prior to this.

7. Maintain unobstructed urine flow.

8. Replace all closed collecting systems contaminated by inappropriate technique, accidental disconnection, or leak, immediately.

9. Do not change catheters at arbitrarily fixed intervals.

10 Replace the bottle with a fresh sterile bottle everyday.

11. Give proper instructions to catheterised ambulatory patients.

12. Separate catheterised patients from each other whenever possible. Separation of patients with and without urinary tract infection is particularly important.

Note : 3

PROCEDURE GUIDELINE FOR CATHETER CARE

Articles Needed.

1. Catheterisation Tray (includes sponge holding forceps, small steel bowl, sponges, gauze pieces, fenestrated towel, 2ml-syringe, 20ml-syringe, kidney tray, etc.).

2. A pair of gloves

3. Ur diluted Savlon

4. Distilled water

5. Neomycin ointment

Procedure

—It is a sterile procedure.

—Prepare Savlon 1/100 using distilled water and Savlon (three drops of Savlon or one small division in 2ml-syringe for 2ml distilled water).

—clean the meatal catheter junction with the prepared solution.

—Apply Neomycin ointment at the meatal catheter junction and wrap a sterile gauze around the catheter at the junction.

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