CONTAINING A CARBAPENEM RESISTANT ENTEROBACTERIACEAE OXA-48 OUTBREAK WITH ENVIRONMENTAL CLEANING WITHOUT CLOSING THE UNIT

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1. Wits Donald Gordon Medical Centre

1. CONTEXT

Wits Donald Gordon Medical Centre is South Africa's first private academic hospital with 190 beds, including 15 critical care unit (CCU) and 14 high care (HC) beds. The CCU is a closed unit lead by an intensivist. The patient profile includes high-risk transplant patients. Housekeeping staff are outsourced.

A carbapenem resistant organism, subtype – OXA–48$_{like}$, was first identified in South Africa in 2012 and in our hospital on 1 November 2012. The organism has the potential to spread widely.

2. PROBLEM

The outbreak of OXA–48 continued despite all our attempts to contain it. Mortality of infected patients was 50%. By April 2013 it had reached a level that would normally require closure of the units, based on CDC guidelines[1], but this is not possible in our circumstance, due to the unpredictability of transplants.

3. ASSESSMENT OF PROBLEM AND ANALYSIS OF ITS CAUSES

From the assessment of positive cultures for OXA–48$_{like}$ infections (including blood, urine, sputum, wound swabs, wound fluid etc.) and the bed placement of culture-positive patients, we concluded that the spread of these infections take place horizontally. Less than optimal hand hygiene and environmental cleaning were thought to be contributing factors.

4. INTERVENTION

The aim was to reduce the incidence of the spread of OXA–48$_{like}$ organisms to zero, without closing the CCU and HC units. The approach was to prevent opportunities for the spread of resistant organisms.

Interventions included strict contact precautions[2]:
i) nursing infected patients on a one-to-one basis; ii) isolating patients until discharge; iii) serving food in disposable containers; iv) minimising patient movement in the hospital.

Proactive screening of patients for OXA–48$_{like}$ was introduced for patients who were in CCU/HC for seven days or longer and treated with a carbapenem, later including patients with possible contact to OXA–48 cases and transfers in from other hospitals.

Staff engagement was critical: i) the importance of hand hygiene was emphasised to nursing staff; ii) in-service training on infection control was given to registrars; iii) most importantly, housekeeping staff were directly engaged in issues of environmental cleaning. Cleaning audits were done at regular intervals using ultraviolet pens and an ultraviolet light to see if marked high-touch areas had been cleaned. External audits were also conducted.

The cleaning regime of rooms included: i) cleaning all equipment used in the room; ii) giving the room a general clean before disinfecting it; iii) doubling the strength of the disinfectant solution; iv) expanding the cleaning regimen to five cleans before a new patient was admitted to the bed (directly after patient leaves; six hours later; another six hours after that; resting the room for 24 hours and cleaning again just prior to a new patient).

5. STUDY DESIGN

Prospective, observational, implementation study.

6. STRATEGY FOR CHANGE

Interventions were adjusted over time when the expected results were not achieved. We used a multidisciplinary approach, including improved supervision and buy-in from housekeeping staff.

7. MEASUREMENT OF IMPROVEMENT STRATEGY

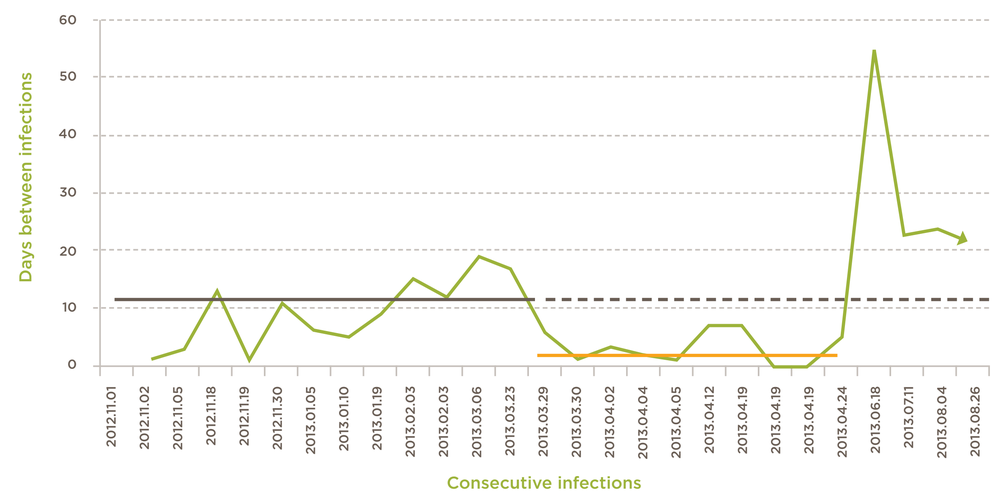
The outcome measure was the days between OXA–48$_{like}$ infections. Process measures included monitoring the effectiveness of the cleaning process through audits.

8. EFFECTS OF CHANGES

Significant improvement was not seen until the end of April when the expanded cleaning regimen was implemented (figure 1).

DAYS BETWEEN OXA–48 INFECTIONS WDGMC-CCU/HC NOVEMBER 2012 – AUGUST 2013

Figure 1



9. LESSONS LEARNT

We managed the outbreak without closing the ward. Instead we isolated and closed the bed for a period of 36 hours during which repeated cleanings took place according to a schedule.

10. MESSAGE FOR OTHERS

Effective environmental cleaning has a significant purpose and effect in outbreak management. It is crucial for enhancing patient safety and health. The whole process requires a team approach.

1. CDC: Communicable Disease Control Manual – Section 9-33, June 2010
2. Mediclinic Corporate Policy: Management of patients with carbapenem resistant enterobacteriaceae, 2012/11/14