Cost Effectiveness of Universal Decolonization in the ICU: A Pre and Post intervention analysis

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Abstract

Background
The University of Kentucky (UK) HealthCare System maintains an active surveillance program to detect MRSA and other multi-drug resistant organisms such as Carbapenem Resistant Enterobacteriacae (CRE) in patients admitted to Intensive Care Units (ICUs). This program includes screening at the time of ICU admission and then weekly during their ICU stay. In November 2016, UK Healthcare stopped placing patients with MRSA and VRE in contact precautions and simultaneously implemented universal decolonization for MRSA using a onetime application of nasal povidone iodine to the nares and a daily application of 2% chlorhexidine gluconate (CHG). We analyzed the impact of this for MRSA and CRE acquisition and costs.

Methods
This study retrospectively reviewed data collected by the UK HealthCare Infection Prevention and Control department for adult patients admitted to an ICU between November 2015 and October 2017 as well as cost data associated with discontinuing isolation and expanding decolonization. Descriptive analysis was performed to determine the hospital acquired MRSA and CRE rates of infections and colonizations. . Cost analysis was determined by total cost of materials and infections pre and post intervention.

Results
The combined MRSA and CRE infection rate fell 48% (3.88 per 10,000 patient days to 2.00; p=0.083) in the post intervention period. We estimated a reduction of 11 infections (8 MRSA and 3 CRE). The opportunity cost associated with preventing those 11 infections was $410,027. When incorporating all materials and infection cost, we had a total savings of $152,096.84.

Conclusion
The intervention of stopping contact precautions for MRSA and implementing universal decolonization in adult ICUs was associated with a significant decrease of both MRSA and CRE infections. This intervention was cost effective with a savings of $152,096.84.

Introduction

- Universal decolonization of adult ICU patients has been shown to reduce MRSA positive clinical cultures, reduce bloodstream infections from any pathogen, and reduce bacteriuria in male patients.
- Chlorhexidine bathing is currently recommended as a CRE transmission prevention strategy by the CDC, however, limited data exists on its effectiveness.

Introduction

- The University of Kentucky (UK) Healthcare System maintains an active surveillance program to detect MRSA and other multi-drug resistant organisms such as Carbapenem Resistant Enterobacteriacae (CRE) in patients admitted to Intensive Care Units (ICUs) which includes screening at the time of ICU admission and then weekly during their ICU stay.
- On November 1, 2016, UK Healthcare discontinued contact precautions for MRSA and simultaneously implemented universal decolonization using a onetime application of nasal povidone iodine and daily 2% chlorhexidine (CHG) applied via a pre-impregnated wipe in adult ICUs.
- This study aimed to determine the effect of this intervention on MRSA and CRE acquisition in adult ICU and costs.[3,4]

Results/Tables

Fig 1. MRSA and CRE Rates Per year Pre and Post Intervention

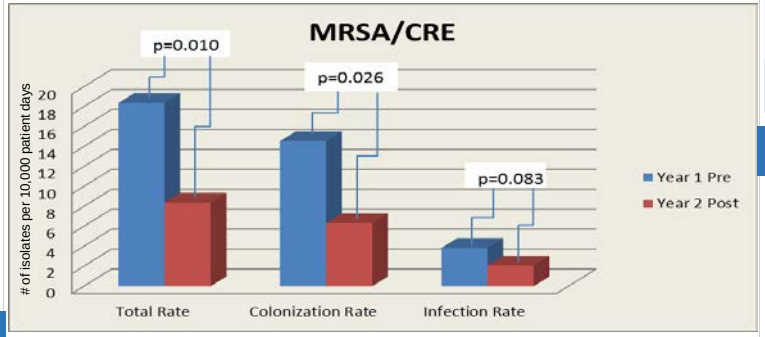

Table 1. Hospital Acquired MRSA and CRE Infections Pre and Post Intervention

Infection	Year 1 Pre	Expected Year 2 Post	Actual Year 2 Post	Number Prevented
MRSA	16	20	12	**8**
CRE	3	4	1	**3**
MRSA & CRE	19	24	13	**11**

Results/Tables

Table 2. Cost Analysis of Materials and hospital acquired infections

Materials / Infection	Pre-Intervention Cost ($)	Post-Intervention Cost ($)
Gowns	153,108.59	58,543.95
Povidine Iodine nasal swabs	1,998.53	109,235.85
CHG Hibiclens	36,899.30	10,125.00
CHG Wipes	2,656.94	274,688.71
Expected MRSA Infection Costs[3]	693,140.00	415,884.00
Expected CRE Infection Costs[4]	177,028.00	44,257.00
Total	1,064,831.35	912,734.51

Conclusions

- A total of 11 hospital acquired MRSA or CRE infections were estimated to have been prevented (8 MRSA and 3 CRE). (Table 1)
- When incorporating all materials and infection cost, our study showed a total savings of $152,096.84.
- The intervention of stopping contact precautions for MRSA and implementing universal decolonization in adult ICUs was associated with a significant decrease of both MRSA and CRE infections.

References

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