

Reducing Hospital-Acquired Blood Stream Infection (HA-BSI) in General Medical Wards and High Dependency Ward (HDW): An Improvement Project in A Tertiary Hospital

Muhammad Aizat Amiruddin¹, Nurul Ashikin Adnan¹, Ahmad Kashfi Ab Rahman¹

¹ Infectious Disease Unit, Internal Medicine Department, Hospital Sultanah Nur Zahirah Kuala Terengganu, Terengganu, Malaysia.

Introduction

HA-BSI carries a high mortality and morbidity rate, and imposes significant financial burden to hospitals worldwide. We aim to reduce the rate of HA-BSI in our general medical wards and HDW, by reinforcing compliance towards Central Venous Catheter (CVC) care bundle.

Methods

We conducted Continuous Medical Education (CME) sessions for doctors and nurses in the Medical Department on HA-BSI and all components of CVC care bundle. A roadshow was organized covering all medical wards and HDW to demonstrate the “Scrub the Hub” technique, correct CVC dressing and handling practice, and to highlight the CVC insertion checklist and daily CVC review form. Posters, brochures and online reading materials were disseminated through the doctors’ and nurses’ social media groups as reminders and quick references. These interventions were done between the second week of December 2023 through second week of January 2024. We performed regular audits on compliance to CVC care bundle prior to and after the intervention, focusing on correct practices during insertion of CVC, hand hygiene when caring for CVC, scrub the hub technique and proper daily review of CVC’s condition and necessity.

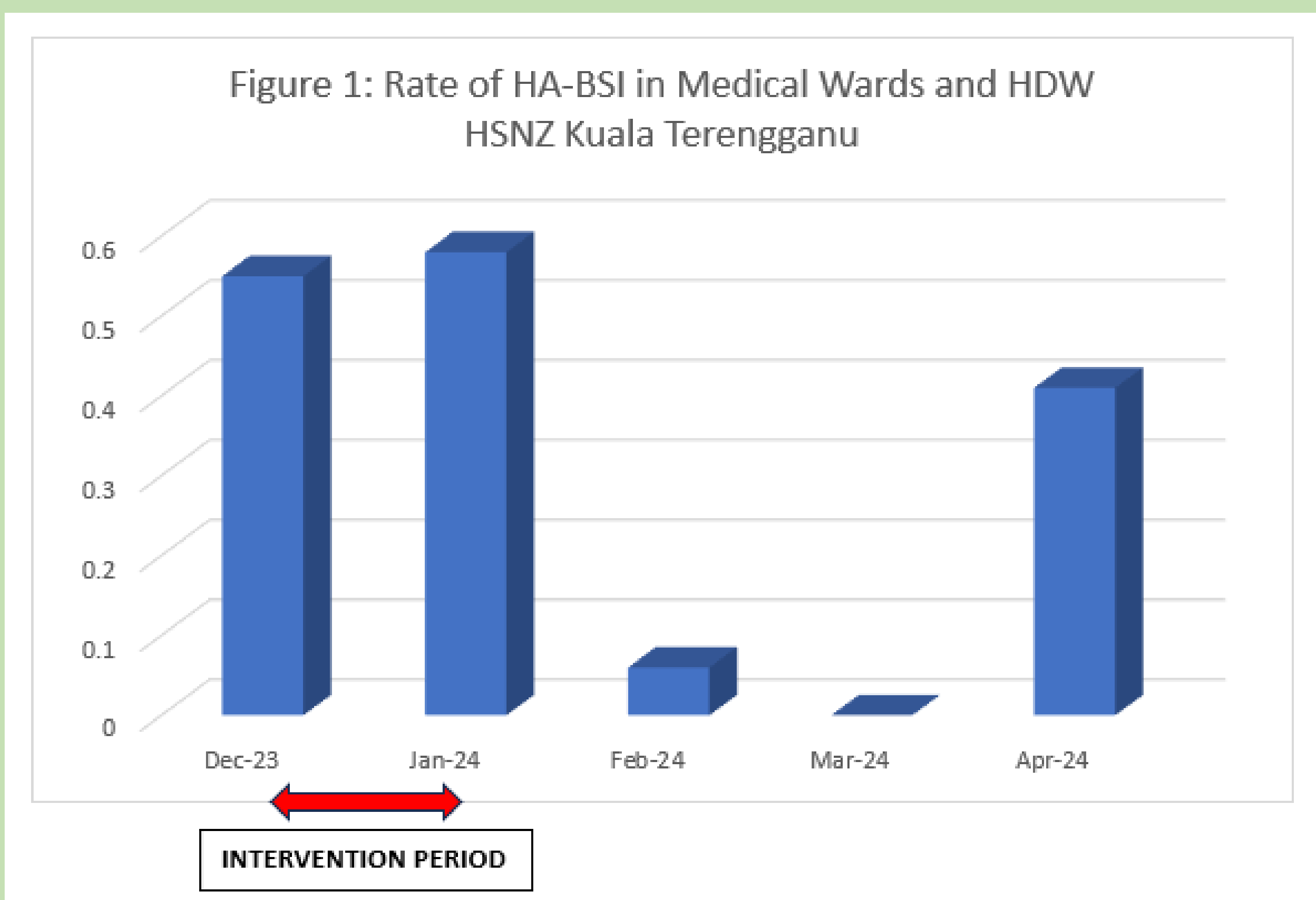
Results

The compliance rate towards CVC care bundle generally showed improvement after the intervention (Table 1). The baseline rate of HA-BSI in the medical wards including HDW in our department was 0.55% and 0.58% in the 2 months prior to intervention and audits. The HA-BSI rate reduced significantly after the intervention for 2 consecutive months to 0.06% and 0%, respectively. However, the rate increased to 0.41% after 3 months of intervention, highlighting the importance of regular interventions of every 3-4 months (Figure 1).

Components	% of Compliance			
	Nov 23 [N:12]	Dec 23 [N:16]	Feb 24 [N:16]	Apr 24 [N:10]
Compliance to CVC Insertion Checklist	41.6	50	50	80
Hand Hygiene	58.3	100	93.8	100
Daily Review of Catheter & Correct Dressing	66.7	50	50	80
Scrub The Hub	58.3	81.3	93.8	90

INTERVENTION PERIOD

Table 1: Results of Audits on Compliance to CVC Care Bundle in Medical Wards and HDW HSNZ Kuala Terengganu



References:

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Discussion

The effectiveness of CVC care bundle in reducing the rate of HA-BSI has been shown in many studies. The evidence of each component has been updated and revised in a recent paper, reinforcing its importance [1]. It encompasses the standard practices during the insertion of a CVC, proper handling and dressing of the catheter and daily review of the catheter’s condition and indication. The components of CVC care bundles include hand hygiene, maximal barrier protection upon insertion, alcoholic chlorhexidine skin anti-septic, daily review of necessity and prompt removal of unnecessary lines.

Education is one of the important methods to increase compliance to CVC care bundle [2,3]. In our project, we initiated the intervention with education sessions for doctors and nurses in the department. The CME sessions successfully covered 85% of doctors (comprised of Medical Officers and House Officers) and 73% of nurses (Ward Sisters and Staff Nurses) in the department. We showed the current baseline rate of HA-BSI, which was the second highest type of Healthcare Associated Infections (HCAI) in the department [4], its burden to the department in terms of bed occupancy, workload and financial burden, and the high mortality and morbidity rate among patients. We discussed the CVC Care Bundle afterwards, focusing on the four components mentioned above.

During the roadshow, as part of our education program, we went to all medical wards and HDW to demonstrate the correct technique of “Scrub the Hub” method, followed by practical session by the staffs themselves in the ward. This method (scrubbing the catheter hub with an antiseptic for 10 to 15 seconds and let dry before insertion) is advocated to reduce HA-BSI, as contamination of catheter hubs is recognized as a source for Central Line Associated Bloodstream Infection (CLABSI). Proper dressing technique was taught, and the staffs, doctor and nurses alike were reminded to comply to the checklist upon insertion of CVC and to fill in the daily CVC review form to determine the necessity and need for removal. Usage of checklists is another method to improve compliance to CVC Care Bundle and besides the daily review form [5].

We distributed online posters on CVC Care Bundle Components via “Whatsapp” groups of different wards and different levels of staffs in the department, on every Thursdays for a month. We also provided a “Google Drive” folder link, containing all references on CVC care bundle for easier and rapid access.

The audits we conducted were unannounced, monthly sessions to assess the baseline compliance rate and the subsequent pattern after the intervention was done. During these audits, the auditors would assess the compliance to CVC care bundle during insertion, and the care and review of catheter afterwards. The results of the audits improved after the intervention, particularly on three components: hand hygiene, compliance to the CVC insertion checklist and daily review of CVC.

The overall rate of HA-BSI showed remarkable reduction of 90.9% on the first month after the intervention, followed by further reduction to 0% in the second month. However, the rates climbed up after 3 months. A study by Yilmaz et al showed that the rate of CVC-BSI was low in the first 3 months post education period but increased by 2.08 times from the third month onward, indicating the need for regular intervention strategies [6].

Conclusion

Reinforcing compliance to CVC care bundle can effectively reduce the rate of HA-BSI in general medical wards and HDW. However, regular interventions need to be carried out in order to have a sustained low rate of HA-BSI in the wards.