AWARENESS OF ANTIMICROBIAL STEWARDSHIP AMONG NURSES IN A TERTIARY CARE HOSPITAL, MUMBAI

Microbiology

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ABSTRACT

Antimicrobial stewardship (AMS) aims to improve the quality of care and clinical outcomes of patients requiring treatment or prevention of infection, while reducing adverse events and preventing the emergence of antibiotic resistance in local pathogens. The present study aimed to study the awareness of AMS among 100 nurses in a tertiary care hospital in Mumbai. A self-instructional module of AMS was distributed to nurses based on pretest results and after 7 days posttest was conducted. Nurses had satisfactory knowledge regarding antimicrobial resistance as regular MRSA screening and induction programmes were conducted in the hospital. Study group had suboptimal knowledge regarding antibiotic prescribing and AMS strategies. Post education, nurses within poor knowledge were significantly shifted to a category describing better knowledge (p<0.05). Antimicrobial stewardship awareness among nurses should be improved by way of educational interventions and reinforcement of the same.

KEYWORDS

Antimicrobial stewardship (AMS), antibiotic resistance, nurses, educational intervention.

Introduction:

Antimicrobial stewardship (AMS) has been defined as "the optimal selection, dosage, and duration of antimicrobial treatment that results in the best clinical outcome for the treatment or prevention of infection, with minimal toxicity to the patient and minimal impact on subsequent resistance [1]"

Educational interventions are more likely to be effective in AMS if their aim is to change behavior, rather than to provide information . Holding one-on-one sessions seems to be a successful approach and results in a decrease in inappropriate antibiotic use. Clear messages, such as distinguishing bacterial vs viral infection, prudent antibiotic use and infection control measures, should be used in this setting [2]. A multidimensional educational intervention programme, including patient educational intervention and clinician intervention resulted in a substantial decline in antibiotic prescription rates (from 74% to 48%) [3]. Similar results have been obtained in Alaska, with a 31% decrease in antibiotic courses per person following an educational programme [4]. A simultaneous educational outreach intervention for parents and providers in USA, demonstrated efficiency in reducing antibiotic prescriptions for children younger than 6 years of age [5].

Current initiatives promoting prudent antimicrobial prescribing and management have generally failed to include nurses, which subsequently limit the extent to which AMS strategies can improve patient outcomes. For AMS programmes to be successful, a sustained and seamless level of monitoring and decision making in relation to antimicrobial therapy is needed. As nurses have the most consistent presence as patient caretaker; they are in the ideal position to provide this level of service. However, for nurses to truly impact on AMS, barriers and facilitators to adopting this enhanced role must be contextualized in the implementation of any initiative. Antimicrobial stewardship (AMS) is everyone's business but nurses as the largest single occupational group in health care, have a key role to play. All these above mentioned factors urged the researcher to assess and educate the staff nurses about antimicrobial stewardship.

Material and Methods:

The study was conducted among 100 nurses in a tertiary care hospital at Mumbai in September 2017. A 25-item survey questionnaire was distributed to the nurses during regularly scheduled infection control rounds and educational meets to study their knowledge regarding antimicrobial stewardship (AMS). The respondents were required to answer the questionnaire on spot. Self-instructional module of antimicrobial stewardship (AMS) based on results of pretest was prepared and distributed to nurses and after 7 days, post test was conducted. The content of the questionnaire was based on antimicrobial stewardship strategies followed in the hospital and was divided into three main domains: antibiotic prescribing, antibiotic resistance and AMS strategies . Student's t test was used to analyse the data and compare the answers given pre and post education. A p value of ≤0.05 was taken as statistically significant.

Results and discussion:

Two hundred questionnaires (pretest and post test) were included for the final analysis.

The respondents were asked few questions to assess their knowledge regarding antimicrobial resistance (Table 1)

	Pretest: Nurses (%) giving correct response(n=50)	Posttest: Nurses (%) giving correct response(n=50)
Methicillin resistant Staphylococcus aureus (MRSA)*	44 (88)	48 (96)
Extended spectrum beta lactamases (ESBL)*	40(80)	44(88)
Metallo beta lactamases (MBL)*	32(64)	40(80)
Intrinsic resistance of organisms*	26(52)	38(76)

* P value: >0.05 (not statistically significant)

The knowledge regarding MRSA and ESBL among nurses was 92% and 84% respectively and the total knowledge regarding antimicrobial resistance was 78%. There was no statistical difference in knowledge of nurses in pretest and post test results. In the present hospital, MRSA screening of staff is carried every 6 months and the nurses are educated regarding multidrug resistant organisms such as MRSA, VRE, ESBL, MBL in their induction programmes on joining of hospital. This might be the reason for the improved knowledge among nurses. The results of the study are comparable to the study done by Karem Alzoubi et al,2009 [6].

Many factors have been associated with the emergence and spread of antimicrobial resistance. In fact, the use of anti-microbial agent, by itself, is considered to exert a selective pressure on resistance . In addition, the use of antibiotics for the treatment of non-bacterial, mostly viral, infections, and the overuse of broad-spectrum antibiotics in the management of bacterial infections promotes antibiotic resistance and increases the costs of health care. Resistant bacteria cause infections that are more difficult to treat; requiring drugs that often less readily available, more expensive and more toxic. In some cases strains of bacteria have become resistant to all available antimicrobial agents. Without effective agents to hold them in check, these infections spread through hospitals and communities causing epidemics that are difficult to control. Prevention is better than cure so there is an important role to educate nurses about antimicrobial resistance [7].

The respondents were asked few questions to assess their knowledge regarding antibiotic prescribing (Table 2)

	Pretest: Nurses (%) giving correct response(n=50)	Posttest: Nurses (%) giving correct response(n=50)
Surgical prophylaxis duration	28(56)	42(84)
Reviewal of antibiotic therapy	20(40)	44(88)
2nd intraoperative dose of cefazolin	22(44)	36(72)
Once daily dosing of aminoglycosides	24(48)	40(80)
Vancomycin shut down therapy	20(40)	44(88)
IV to oral conversion	19(38)	40(80)
Clostridium infection treatment	18(36)	36(72)

Posteducation, nurses within poor and adequate knowledge were significantly shifted to a category describing better knowledge, p <0.05. Ward rounds can result in cooperative decision making between nurses and other healthcare colleagues [8] and although generally not directly involved in prescribing, nurses can influence the decision making of medical and other prescribers through, for example, encouraging medication compliance, monitoring prescription decisions and reducing prescribing errors [9]. Nurse involvement in antibiotic ward rounds could provide nurses, physicians and pharmacists with a venue for prompt dialogue to discuss antimicrobial treatment, indication, and duration, thus further enhancing the multidisciplinary management of AMS to reinforce best practice. Ward nurses are also in a key position to facilitate patient referrals for outpatient antibiotic therapy in instances where patient admission to hospital is for extended antibiotic therapy only. This proactive approach to patient care could reduce patients' length of stay, thus decreasing their risk of nosocomial infections and associated costs, and enabling the patient to continue treatment in their own environment.

The respondents were asked few questions to assess their knowledge regarding AMS strategies (Table 3)

	Pretest: Nurses (%) giving correct response(n=50)	Posttest: Nurses (%) giving correct response(n=50)
Members of AMS team	24(48)	48(96)
Formulary prescribing	20(40)	42(84)
Dose optimizing	18(36)	44(88)
Streamlining/ Deescalation therapy	20(40)	44(88)
Antimicrobial cycling	16(32)	42(84)
Reserved antibiotics	26(52)	48(96)
Antibiogram	24(48)	46(92)
Antibiotic policy	20(40)	42(84)

The knowledge score regarding AMS strategies was 42 % and 89 % in pretest and post test phase respectively and p<0.05. Currently, elements of AMS such as monitoring duration and indication for antimicrobial treatment, instigating prompt de-escalation from intravenous to oral therapy, monitoring for drug allergies and sides effects, monitoring therapeutic levels, ensuring timely administration of antimicrobials and following up on missed doses have primarily fallen into the work remit of physicians and pharmacists. However, due to time constraints, workload and high staff rotation, it may be difficult for these activities to be performed consistently. Nurses work at multiple levels within the clinical setting, playing a key role in patient safety and have the most consistent presence as patient caretaker. With review of medication charts being part of routine professional practice and as the primary healthcare worker within the hospital setting to administer medications, nurses are in a key position to collaborate with AMS teams and contribute to the multidisciplinary management of antimicrobials throughout acute care settings [10].

Nurses may not feel they are in a position to participate in AMS programmes due to lack of knowledge, closely linked to positions of power, particularly within healthcare environments [11]. The challenges associated with influencing antimicrobial management decisions are further complicated through prescribing etiquette, which refers to prescribers reluctance to change colleagues decisions [12]. Indeed, one could argue that moving away from the persistent use of the term 'antimicrobial prescribing' to antimicrobial management would facilitate a more inclusive approach. The term 'prescribing' relates to a specific area of expertise associated primarily with the practice of doctors and pharmacists, eliminating nursing from the decision making process. Acknowledging that it is the management of antimicrobials that leads to the emergence of AMR and nosocomial infections could facilitate a more holistic approach to ensuring antimicrobials are used appropriately and could facilitate nurses' involvement in AMS programmes.

Conclusion:
Thus, the present study highlights the impact of tailored educational materials among nurses targeting antibiotic prescribing, antibiotic resistance and AMS strategies and suggests that such a strategy can be effective and feasible to prevent antimicrobial resistance.

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