

POINT OF VIEW

Under-explored Dimensions of Anti-microbial Stewardship in India

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Abstract

Antimicrobial resistance accounts for the greatest threat to the health system. The most appropriate path to mitigate this menace is a collaborative, multidisciplinary approach combining antimicrobial stewardship with infection prevention. Sustainable efforts to overcome this global problem would require awareness, learning and coordination at various levels in the health system. Government policies, national guidelines, collaborative functioning in research, online training modules, and media have an important role in combating the threat. We recommend a multipronged approach involving the infection control specialist, as well as various cadres of health-care providers, including pharmacists, the nurses and community-level health workers. We also recommend that all health-care professionals prescribing antibiotics take responsibility and understand the adverse consequences of inappropriate and suboptimal antibiotic usage. Certain countries in the world have already in place the antimicrobial stewardship programme with multi-disciplinary approach. India needs to have a strengthened anti-microbial stewardship programme involving all cadres of health-care providers.

Introduction

Antimicrobial resistance represents the greatest threat to public health.¹ It has emerged as a complex global health challenge with a wide spectrum of bacteria, fungi, parasites and viruses developing antimicrobial resistance. The widespread inadvertent use of antibiotics, retreat of the pharmaceutical industry from developing new antibiotics,² global spread of antibiotic resistant and multi-drug resistant organisms³ along with rapid and accessible international travel⁴ have been the major contributing factors for development of this dreaded situation. Strengthening antimicrobial stewardship programme in coordination with infection control measures is of utmost importance to mitigate this global menace.

Antimicrobial stewardship refers to a coordinated set of interventions designed to improve upon and measure the appropriate usage of antimicrobials, by promoting the proper selection of optimal antimicrobial drug regimen, in appropriate dose, for a proper duration and via the appropriate

route of administration.⁵ Furthermore, antimicrobial stewardship is a programmatic approach towards the rational use of antibiotics. Educating the health-care providers as well as the common man about the rationale behind antimicrobial stewardship can be an instrumental tool in paving the pathway for a successful antimicrobial stewardship programme (ASP). The strategic aims of the antimicrobial stewardship programme include improving the knowledge and understanding of antimicrobial resistance pattern, conserve the effectiveness of the existing treatment options and stimulating the development of newer antibiotics and novel therapies.⁶

Indian perspective: Antimicrobial stewardship

The Chennai Declaration in 2012,⁷ laid the roadmap for India to tackle the

challenge of antimicrobial resistance. It emphasized on the roles and responsibilities of various organizations and individuals of the nation starting from the Ministry of Health, Drugs Controller General of India, Hospital Infection Control Committee to the Antibiotic steward, and the pharmacy in contributing towards a robust antimicrobial stewardship programme. Currently the major contributors in the ASPs include infectious disease specialist, clinical microbiologist, physician trained in infectious diseases, infection control specialist and a clinical pharmacist along with the administrative and financial support. However, the Chennai Declaration has focussed some light on the role of the pharmacists in the successful implementation of the ASP.

Currently, the missing link in the organizational chart is the nursing staff. The role of nurses in the antimicrobial stewardship programme was not well defined and not much responsibility was ascribed to them to be a major contributor in combating the global threat to public health. The role of the nursing staff in antimicrobial stewardship which has been under-explored in India till date, has been well highlighted upon in ASP programmes in place in other leading countries in the world.⁶ Increasing the awareness of nurses regarding the importance of appropriate antimicrobial use and its impact on infection outcome is very essential for obtaining the desired goal of successful implementation of antimicrobial stewardship program. This review, including the other very well cited documents in this review lacks the specificity emphasizing health associate's significance in antimicrobial

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stewardship in Indian perspective. So, we wish to communicate to our peer friends that the contribution of the health associates in making the antimicrobial stewardship a successful endeavour is indispensable. This fact has already been well accepted in world review of ASP. It would thus help in improving the outcome of the current ASP in place.

Various guidelines for the development and strengthening of the ASPs have always highlighted multipronged approach in tackling the menace of antimicrobial resistance.⁸ Various modalities and methods that have been validated for ASP outside India, but yet are under-explored in India and need to be given credit are the inclusion of the paramedics, including the nursing staff in the ongoing ASP. Very brief mention about the inclusion of nurses in ASP has been made, which is limited to a few sentences. The nurses through their nursing activities are actually already participating in the antimicrobial stewardship activities, though it has not been well acknowledged and integrated upon. The daily nursing practices if evaluated carefully in a step-wise fashion, starting from the arrival of a patient in an inpatient admission, to the 24 x 7 patient progress monitoring and reporting will enlighten us about the key role played by the nurses in combating antimicrobial resistance.

Nurses' Role in Antimicrobial Stewardship

The initial triage of the patient on arrival in the emergency department and necessary isolation precautions if any required, can be done by the judgement of the admitting nurse, though the decision may be later reviewed and modified, guided by the microbiology results and the infectious disease specialist. Secondly, identifying medication allergy history and its documentation is also a well-accepted responsibility of the nursing staff. Timely and proper identification of penicillin allergy⁹ and its differentiation from adverse reactions that would not preclude the usage of certain other group of antibiotics needs to be taken care of by the nursing staff. This could be achieved by proper training of the nursing staff in this regard and also by retrograde analysis of the patient's past drug allergy history. This would in turn help in minimizing antibiotic

costs, preventing selection of antibiotic resistant organisms.

The 24 x 7 patient monitoring by the nursing staff, more so, in the first 24-36 hours has a major implication in the antimicrobial stewardship programme. Antibiotic time-out, de-escalation and discontinuation of antibiotics not required can be under the direct purview of the nurses, after obtaining the initial microbiology reports.¹⁰

The nursing staff can be educated regarding the importance of obtaining appropriate samples for culture prior to the beginning of the antibiotics. They can then contribute by collecting and sending such specimen in suitable clinical settings without waiting for the clinician order. The relevant samples include straight urinary catheterization to obtain urine specimen in urgent admissions for suspected sepsis, to obtain stool specimen for testing for *Clostridium difficile* infection in suspected patients of antibiotic associated diarrhoea, and to obtain blood samples for follow-up blood cultures for gram positive cocci to detect potential cases of sustained duration *Staphylococcus* bacteraemia that could be attributed to intravascular infection.¹⁰

The nursing staff can also contribute in preventing developing of AMR by ensuring that the patient receive the antibiotics for the appropriate duration prescribed, and be converted from intravenous to oral at the earliest opportunity.^{11,12} Reviewing of the medication charts is a part of routine professional practise amongst the nursing staff. The nursing staff are the primary healthcare providers in the hospital setting, and are thus in a key position to collaborate and coordinate with the AMS teams and thus contribute to the multipronged approach of successful AMS implementation in the hospital setting.¹³

Safety and quality measures, the pillars of nursing care, are one of the core elements of ASP. The utility of "bundle" initiatives can help in reduction in central line associated bacteremia, surgical site infections, catheter associated urinary tract infection (CAUTI), control and prevention of *Clostridium difficile* associated diarrhoea and other hospital acquired infections. This can ultimately result in being a major contributor to the

reduction in morbidity and mortality of the patients. It can also help to bring about behavioural modification in the patients and the doctors towards the nursing staff.

The role of nursing staff in the hospital infection control has been addressed since long. The incidence of CAUTI was reduced by 70% and catheter use was reduced by 50% in a centre where a nurse-directed catheter removal protocol was followed.¹⁴ In a review of 14 RCTs on inter-professional collaboration between nursing staff and the treating physicians, statistically significant improvement in the patient outcome was demonstrated after the implementation of interventions based on interdisciplinary collaboration in all of the studies except one.¹⁵

An Integrated approach to Antimicrobial Management

The nursing staff is the connecting link between the infectious disease physician, the consultants, the pharmacy and the laboratory. Broadening of the ASP acceptance can be established by formal inclusion of the nursing staff in the programme with multidisciplinary approach. The routine patient care responsibilities of the nurses when compared with the basic principles and components of ASP, reveals a major overlap between the two.

Efficient communication and education about the antimicrobial stewardship is the cornerstone for strengthening and successful implementation of the antimicrobial stewardship programme. It is very essential not only for the treating physicians, but also for the nurses, who constitute the single largest group in health care providers. Imparting knowledge and training about ASP may be included in the educational curriculum of the nurses along with the existing infection control measures. It would be a vital step in boosting the desired outcome of the ASP. The main target of this education would be the best assessment of the patient's response to the given therapy, early and safe switch-over to oral therapy, shortening of the duration of hospital stay and efficient out-patient management of the patients.

Involvement of the nursing staff in the AS could thus prove to be a time and cost-efficient method for the best utilization of the available resources.

With the global threat of antimicrobial resistance being on the rise, it is imperative to recognize the loopholes in the current ASP and realize that formal inclusion of the nursing staff in the ASP would be a giant leap towards the implementation of an efficient and effective ASP.

The indigenous role of the nursing staff in the antimicrobial stewardship programme has been already been addressed by many countries including the USA, the UK, Australia, South Africa and Colombia.¹⁶ The nursing staff have been actively involved in the multidisciplinary approach of these countries towards tackling the great burden on public health, the development of antimicrobial resistance. Formal inclusion of the nursing staff in the antimicrobial stewardship programme in India is the call of the day.

The common practise observed in India is towards not being very receptive towards the suggestions provided by the paramedical staff, but the formal inclusion of the nursing staff and pharmacists in the ASP would bring about a behavioural modification towards them. This aspect has already been addressed, emphasized upon and has been taken positively in relation to ASP in the foreign literature.

Conclusion

Immense faith on the nurses has been imparted by the general public since the time of Florence Nightingale. Formal inclusion of the nurses in the antimicrobial stewardship programme

would provide a great impetus to the broad acceptance, successful implementation and efficiency of the programme. Integrating the nursing staff in the ASP would thus be a giant leap towards improving the performance of the programme along with achieving of the desired goals in order to face the global menace of antibiotic resistance.

Keeping all these things in view, it is the need of the hour to approach towards the under-explored dimension of ASP in view of the welfare of the country, the state, the individual hospitals and also, towards giving morbidity and mortality benefit to the patients. Thus, the formal inclusion of the paramedics and nursing staff in the ASP and their active involvement in the programme should be encouraged and this message should spread rapidly among the medical fraternity, so as to give an impetus to the ongoing ASP.

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