



Brief summary

New Treatment Guidelines for Infectious Entero-Pathogens in Nepal?

Evidence of resistance amongst commonly used antibiotics in Sukraraj Hospital, Kathmandu

Key Messages

- Inappropriate use of antibiotics contributes to antimicrobial resistance (AMR). Rationale prescription by clinicians, empowered by evidence of resistance patterns is essential to effective antimicrobial stewardship.
- Evidence-based diagnosis of infectious diseases informed by high quality testing and procedure is essential to rational prescribing.
- The study found significant variation in the number of samples received combined with missing information in laboratory databases. More robust records management is needed with on-going audit of procedures. Improving information systems requires investment in human resource including staff training and laboratory infrastructure.

What is the problem and why is it important?

The study identifies weaknesses in AMR surveillance in a public hospital setting. Effective surveillance relies on high quality and continual assessment of resistance patterns. There is limited information on resistance patterns in Nepal for two enteropathogens (*Salmonella* and *Shigella* spp.). Inadequate laboratory processes represent a significant gap in knowledge with important treatment ramifications. On-going surveillance is needed to assess emerging strains of drug resistant bacteria. This will inform appropriate interventions, improve antibiotic consumption and minimize selection pressure. Improved AMR surveillance will further provide knowledge and understanding of the geographical distribution of species and AMR throughout the nation and globally.

How did we measure it?

The study focused on patients with febrile illness and gastroenteritis visiting Sukraraj Tropical and Infectious Disease Hospital, Nepal. The study used 5 years' data related to blood and stool samples culture and disc sensitivity tests from the medical records and laboratory electronic database. The data were anonymized with double-entry validation completed. We analyzed a total of 11,356 blood samples and 5,779 stool samples submitted from the year 2015 to 2019 and among the culture positive samples, we assessed the proportion of blood cultures positive for *Salmonella* spp. and stool cultures positive for *Salmonella* and *Shigella* spp.

Reference: Bastola A, et. al. High Resistance of *Salmonella* spp. and *Shigella* spp. in Blood and Stool Cultures from the Sukraraj Tropical and Infectious Disease Hospital, Kathmandu, Nepal, 2015-2019. Trop. Med. Infect. Dis. **2021**, 6, 59. <https://doi.org/10.3390/tropicalmed6020059>

e-mail:
docanup11@gmail.com

What did we find?

- Among 390 culture positive blood samples, the proportion of *Salmonella* spp. was 44%, 34% being *S. Typhi*, 10% being *S. Paratyphi*. The proportion of *Salmonella* spp. isolated from blood was the highest in patients of age <21 years (71%) followed by 21-40 years age group (42%) and predominantly higher in male population(47%) .
- Of 357 culture positive stool samples, the proportion of *Salmonella* and *Shigella* spp. was 45% and 31% respectively. *Salmonella* spp. were more frequent in the age group of 41-60 years (57%) and predominant in females (46%). *Shigella* spp. was frequently seen in the age group of <21 years (49%) with male predominance (33%).
- The *S. Typhi* and *S. Paratyphi* from blood were most resistant to nalidixic acid (71% and 68% respectively) followed by ciprofloxacin (61% and 68% respectively). Likewise, *Shigella* spp. from stool were highly resistant to nalidixic acid (59%) followed by tetracycline (40%) and amoxicillin (38%).

Implications

- There is an urgent need to assess the use of nalidixic acid, amoxicillin and tetracycline in the empirical treatment of enteric fever and shigellosis.
- Salmonellosis and shigellosis are commonly reported amongst the younger and itinerant populations accessing this public hospital. Improving access to clean drinking water and sanitation should be a public health priority to prevent illness and antibiotic consumption.
- Establishment of minimum inhibitory concentration (MIC) determination of ciprofloxacin should be carried out as gold standard method for detecting reduced susceptibility of the particular drug.