



PREDICTION OF INFECTIONS PREVAILING IN A GEOGRAPHICAL REGION THROUGH MICROBIAL TESTS DONE IN A TERTIARY CARE CENTRE, BHUBANESWAR, ODISHA

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ABSTRACT

Kalinga Institute of Medical Sciences has a state of art microbiology lab that receives on an average 2000 samples in any given day to test for various infections. In spite of advanced diagnostics, culture of various body exudates continue to be the gold standard to identify the exact etiological agent especially bacteriological. These tests are done routinely besides as a part of treatment of admitted patients in order to prescribe apt antibiotics to an admitted patient. **Aims & Objectives:** The current study hypothesizes that:

1. Exudates examined at the micro lab that hint at the common infections prevailing in the community and also probably the hospital acquired infections.
2. To decide on parameters like skill sets of the lab technicians and any other quality measures that should be undertaken to improve upon the lab reporting.

With this view, an integrated secondary data based study was attempted by Dept of Community Medicine and Microbiology wherein the culture results of all patients regardless of age, gender and form of exudates and departments were taken from the record register for the months of June-July 2015 ; entered in excel sheet and analysed for any trends of infections that are common to the people in this part of state. Data of 2 months which came out to be 410 culture reports were collated.

Results showed that culture was done for 51.2% males. 40% of the results were for routine OPD cases and among referral departments ICU accounted for highest ie 22% followed by Medicine (12.5%) and Pediatrics (9.8%). Irrespective of type of exudates, E.Coli accounted for highest ie 18% followed by Enterococcus which was 9%. E. Coli was also commonest infection reported from females. Enterococcus was commonest among infants. For lab records 8.7% reports were contaminated mostly for women ie 69% which meant that special precautions should be undertaken to take the specimens in case of women.

Conclusion: This simple study suggests the epidemiological patterns of infections in June July months in a rain prone state of Odisha and helps the hospital administration to take steps to initiate target interventions for the same.

KEY WORDS: Microbiological infections; culture reports, E Coli, Lab records

Introduction

The active involvement and cooperation of the microbiology laboratory is undeniably important to take corrective measures for the infection control program, particularly in surveillance and the use of this data for epidemiologic purposes. Surveillance is now a proven tool, used to identify possible infection problems, monitor infection trends, and assess the quality of care in the hospital. It requires high-quality laboratory data that are timely, routinely analysed, decisions circulated and easily accessible.¹

Laboratory investigations are the mainstay of reaching any diagnosis. Kalinga Institute of Medical Sciences, Bhubaneswar is a private medical college along with a super speciality hospital catering to the health care needs of Southern half of Bhubaneswar, capital of Odisha state, India- state of art microbiology lab that receives nearly 2000 samples in any given day to test for various infections. In spite of advanced diagnostics, culture of various body exudates continue to be the gold standard to identify the exact etiological agent especially bacteriological. These tests are not only done routinely to arrive at a diagnosis but also are done as a part of treatment in order to prescribe apt antibiotics to an admitted patient.²

The current study hypothesizes that the results of the exudates examined at the micro lab could perhaps hint at the common infections prevailing in the community and also probably the hospital acquired infections.

The results also are expected to hint at parameters like skill sets of the lab technicians and any other quality measures that should be undertaken to improve upon the lab reporting.

Materials and Methods:

The study was a cross-sectional primary data analysis done as a joint venture by the Departments of Community Medicine and Microbiology and duly cleared by the Institutional Ethics Committee. The culture results of all patients regardless of age, gender and form of exudates and ordering departments were taken from the record register for the months of June and July 2015 ; entered in excel sheet and analysed for any trends of infections that are common to the people in this part of state. Data of 2 months which came out to be 412 culture reports were collected.

The data thus collected was analysed in SPSS version 16 and percentages and chi square was used to note any significance of the data reported.

Results:

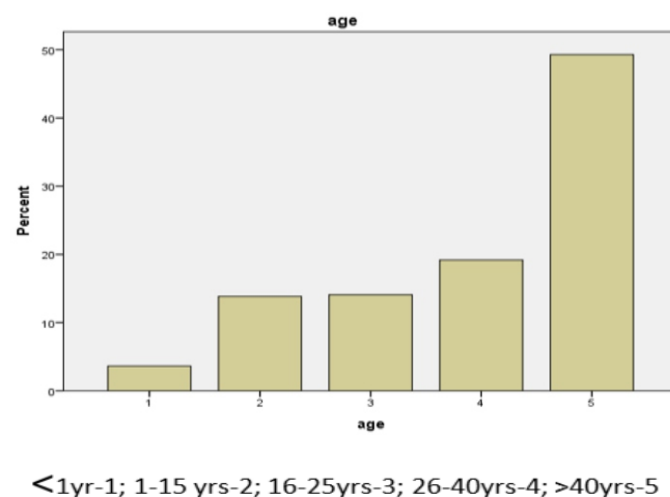


Figure 1

Out of the 412 samples analysed, male: female ratio was 51.2: 48.8. As seen in the figure above highest culture was done among the age group more than 40 years of age (43.9%). This could hint at a rampant use of antibiotics in the lower age groups and immediate response and hence there was no need of getting culture done. Another trend that is seen in this study is the rising trend of seeking culture reports across increasing age groups.

Table 1: Types of cultures done in the sample

Types of exudates	gender		Total
	F	M	
Ascitic	1	4	5
Bed sore	1	0	1
catheter	1	1	2
CSF C/S	6	17	23
E T Secr	3	2	5
Foley's	1	1	2
High vaginal	1	0	1
Peritoneal	0	2	2
Pleural	2	3	5
Pus C/S	10	12	22
Sputum C	4	19	23
Stool C/	10	8	18
swab c/s	0	1	1
Synovial	1	0	1
tacheal	0	1	1
Throat S	4	7	11
Tracheal	3	4	7
urine C/	141	106	247
vaginal	2	0	2
wound Swab	11	23	34
Total	201	211	412

The above table showed that in the two months duration urine culture was reported maximum ie 59.9% and 1.33 times in the females. This hints that urinary infection is a high public health priority in the area and also hints at compromised sanitary conditions prevailing in the community.

As per analysis details 40% of the cultures were routine. NICU accounted for accounted for highest ie 22% followed by Medicine (12.5%) and Paediatrics (9.8%).

Table 2. Microbial isolates detected

	Frequency	Percent
Acetobacter	10	2.4
Candida sp	7	1.7
Citrobacter	3	.7
contaminated	36	8.7
E Coli	75	18.2
Enterococcus	37	9.0
insignificant bacteriurea	11	2.7
Klebsiella sp	19	4.6
NPO	29	7.0
Proteus mirabilis	2	.5
Pseudomonas sp	11	2.7
Staph aureus	26	6.3
sterile	146	35.4
Total	412	100.0

Table 2 brings out that irrespective of type of exudates, *E.Coli* accounted for highest ie 18% followed by *Enterococcus* which was 9%. *E. Coli* was also commonest infection reported from females. *Enterococcus* was commonest among infants. For lab records, 8.7% reports were contaminated mostly for women ie 69% which meant that special precautions should be undertaken to take the specimens for culture in case of women.

Conclusion and Recommendation

This simple study suggests the epidemiological patterns of infections in the rain hit months of June and July in a tropical and predominantly coastal state of Odisha and would help the hospital administration to take steps to specifically target these diseases. *E.coli* is an important infection to watch out both in terms of transmitted infection and nosocomial infection. Strong disinfectants should be used by hospital administration. Clinical discretion should be used before ordering for culture as in our study 35% were sterile exudates.

In order to keep inadequate samples to the minimum, special training should be given to lab technicians from time to time. These simple tips can help restrict the lab culture load and raise the quality of service rendered to patients.

This is an example of lab surveillance that should be an innate part of every lab system wherein all forms of tests should be compiled and analysed for a community diagnosis or information that can hint interventions at community level.³

In other studies like ours enteric pathogens have registered to be maximally isolated in cultures especially in under five children, 4, 5 though in this study this kind of age wise stratification was not possible as all the exudates were taken into consideration.

The above study though undertaken for a limited period is an eye opener regarding lots of issues which if addressed would improve the quality of care.

Culture would also be a major step to improve the overuse or irrational use of antibiotics, which has now become a global burden, 6, 7, 8 evidences of which are not just reported rampantly in India but also elsewhere in the world.

Hence the recommendations of this small dipstick study may be used in a long way to improvise the lab as well patient care.

REFERENCES:

- Emori TG, Gaynes RP. An overview of nosocomial infections, including the role of the microbiology laboratory. *Clinical microbiology reviews*. 1993 Oct 1;6(4):428-42.
- Winkens R, Dinant GJ. Rational, cost effective use of investigations in clinical practice. *British Medical Journal*. 2002 Mar 30;324(7340):783.
- Kant L, Krishnan SK. Information and communication technology in disease surveillance, India: a case study. *BMC Public Health*. 2010 Dec 3;10(Suppl 1):S11.
- Nair GB, Ramamurthy T, Bhattacharya MK, Krishnan T, Ganguly S, Saha DR, Rajendran K, Manna B, Ghosh M, Okamoto K, Takeda Y. Emerging trends in the etiology of enteric pathogens as evidenced from an active surveillance of hospitalized diarrhoeal patients in Kolkata, India. *Gut Pathogens*. 2010 Jun 5;2(1)
- Ghosh AR, Nair GB, Dutta P, Pal SC, Sen D: Acute diarrhoeal diseases in infants aged below six months in hospital in Calcutta, India: an aetiological study. *Trans Roy Soc Trop Med Hyg*. 1991, 85: 796-798. 10.1016/0035-9203(91)90459-C.
- Gaash B. Irrational use of antibiotics. *Indian Journal for the Practising Doctor*. 2008;5(1):03-2008.
- Kotwani A, Wattal C, Joshi PC, Holloway K. Irrational use of antibiotics and role of the pharmacist: an insight from a qualitative study in New Delhi, India. *Journal of clinical pharmacy and therapeutics*. 2012 Jun 1;37(3):308-12.
- Ibeawuchi R, Mbata T. Rational and irrational use of antibiotics. *Africa Health*. 2002 Jan 1;24(2):16-8.