



Original Research Article

Incidence and Prevalence of Enterococcal species, Isolated from Various Clinical Samples, in Tertiary Care Hospital at Darbhanga, Bihar

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Abstract

Objective: The aim of present study was to evaluate the incidence and prevalence of Enterococci species in different clinical samples.

Materials and Methods: A total of 17162 clinical samples (Urine, Pus, Blood, Wound swab, peritoneal fluid, etc.) were received from different OPD and IPD to our department. All the samples were processed with standard procedure. Isolation and Identification of Isolates were done on the basis of Grams staining, motility, blood agar, mac-conkeys agar, nutrient agar, bile aesculin hydrolysis tests, PYR test and salt tolerance test.

Results: Out of 17162 clinical samples, a total of 354 (2.06%) Enterococci isolates were isolated. Enterococci were more frequently isolated from urine (60.46 %) followed by pus (19.20%) and wounds (12.72%). Among the 354 isolates of Enterococci, only 201 (56.78%) isolates represented pure cultures of Enterococci, whereas 153 (43.22%) grew along with other Gram positive or Gram negative organisms of which majority were *Pseudomonas aeruginosa*, *Escherchia coli*, *Proteus species* and *Staphylococcus aureus*. The majority of the isolates were *E.faecalis* 83.61%, while *E.faecium* accounted for 16.39 %.

Conclusion: The incidence and prevalence of enterococcal urinary tract infection is increasing due to the result of use of catheterization and irrelevant, improper, under dose antimicrobials. So consider the enterococcal species as essentially pathogenic as they are isolated in pure culture from various clinical specimens.

Keywords: *Enterococcus species, prevalence, VRE, Nosocomial infections.*

Introduction

Enterococci are Gram positive oval cocci arranged in pairs, usually non motile, non hemolytic translucent colonies. In mac-conkey^s agar they produces minute magenta pink colonies, bile aesculin hydrolysis tests is positive, PYR test is

positive and can grow in extremes of salts, (salt tolerance test is positive) and produce various infections in humans and animals. Although enterococci are considered to be of low virulence, they are now recognized as second common cause of healthcare associated infections. The recent

years have witnessed more of enterococcal infections like mitral valve endocarditis, urinary tract infections, bacteremia, late onset neonatal sepsis, meningitis, burn surface infection and intra-abdominal infections mainly because of their increasing resistance to several antimicrobial agents. The species most commonly involve in human infections is *E. faecalis* and *E. faecium* and the increasing occurrence of high resistance to antibiotics especially in hospital settings.

Vancomycin Resistant Enterococcus (VRE) has been reported worldwide. The incidence of enterococcal infections and species prevalent in India are not thoroughly investigated. Few studies from India reported *E. faecalis* as the most prevalent species. In a CDC survey of nosocomial infection, enterococci accounted for 13.9% of urinary tract infection, as a sole agent second only to *Escherchia coli*. In a study conducted by Desai PJ, Pandit D, Mathur M, Gogate. A in 2001 Mumbai, 18% isolates represented pure culture of enterococci, whereas the rest grew along with other gram positive or gram negative organisms.

The present study was undertaken with the objective to isolate enterococci and study the distribution and prevalence of various species of enterococci isolated from clinical specimens.

Materials and Methods

The present study was conducted in the Department of Microbiology, Darbhanga Medical College, Laheriasarai, Darbhanga during the period of January 2016 to October 2018. A total of 17162 clinical samples (urine, blood, pus and wound swabs etc.) were received in our department, included in the study. All the data regarding age, sex, presenting complains were noted. Isolation and Identification of Enterococcal Isolates were done on the basis of Gram^s staining, motility, blood agar, mac-conkey^s agar, nutrient agar, bile aesculin hydrolysis tests, PYR test and salt tolerance test.

All the media and Ingredients for the sugar fermentation media were obtained from Himedia Mumbai.

Results

Out of 17162 samples tested, a total of 354 (2.06%) enterococci isolates (296, 83.61% *E. faecalis* and 68, 16.39% *E. faecium*) were obtained. Enterococci were more frequently isolated from urine 214 (60.46%) followed by pus 68 (19.20%), wounds 45 (12.72%).

Among the 354 isolates of enterococci, only 201 (56.78%) isolates represented pure cultures of enterococci, whereas 153 (43.22%) grew along with other Gram positive or Gram negative organisms of which majority were *Pseudomonas aeruginosa*, *Escherchia coli*, *Proteus* species and *Staphylococcus aureus*.

The majority of the isolates were *E. faecalis* 83.61%, while *E. faecium* accounted for 16.39%.

Table -1 Shows Age distribution of patients.

Age group of patients in years	Total no. patients included in the study	Percentage
Less than 10 years	543	3.17
11-20	2248	13.09
21-30	3574	20.82
31-40	3607	21.01
41-50	4020	23.42
51-60	1534	8.94
61-70	1250	7.29
More than 70	386	2.25
Total	17162	

Table-2 Shows Sex distribution of different age group of patients

Age group of patients in years	Male		Female	
	Total no. patients	Percentage	Total no. patients	Percentage
Less than 10 years	265	1.55	278	1.62
11-20	853	4.97	1395	8.13
21-30	1596	9.29	1978	11.53
31-40	1332	7.76	2275	13.25
41-50	1484	8.64	2536	14.78
51-60	674	3.92	860	5.01
61-70	375	2.18	875	5.09
More than 70	262	1.52	124	0.72
Total	6841	39.86	10321	60.14

Table-3 Shows Total no. clinical sample received in department for culture

Type of clinical sample	Total no. clinical sample included in study	Percentage
Urine	12350	71.96
Blood	262	1.53
Pus	3574	20.82
Surgical wound	476	2.78
Non-Surgical wound	321	1.87
Ascitic fluid	78	0.45
Abdominal drain	65	0.37
Peritoneal dialysis fluid	2	0.01
Tips	21	0.13
Central line	13	0.075
Total sample	17162	100

Table-4 Shows Total no. Enterococcus Isolates

Total no. clinical sample received in the Department	Total no. Enterococcus Isolates, obtained from culture	Percentage
17162	354 E.fecalis - 296 (83.61%) E.fecium - 58 (16.39)	2.06

Table-5 Shows Total no. Enterococcus Isolates, Isolated from various clinical samples

Type of clinical sample	Total no. Enterococcus Isolates, obtained from culture.	Percentage
Urine	214	60.46
Blood	12	3.38
Pus	68	19.20
Wound	45	12.72
Others	15	4.24
Total	354	100

Discussion

During the 2 years and 10 months of the present study, enterococci formed 2.06% of the isolates from various clinical specimens. Highest incidence of enterococcal isolation was found in urine (60.46%), followed by pus (19.20%), wound swabs (12.72%) and least incidence in blood cultures and peritoneal fluids Recently enterococci are being isolated more frequently from clinical specimens and are increasingly reported as nosocomial pathogens. In India the incidence of enterococcal infections has not been thoroughly investigated.

E.faecalis (83.61%) was the most commonly identified species of enterococci followed by E.faecium (16.39%). Both these species are long known to be significantly associated with the clinical disease, hence their isolation is a cause of serious concern. While these and other enterococcal species are rare among clinical isolates, they may still be encountered in clinical laboratories but their clinical significance is doubtful. Our observations on the incidence of various species are similar to those of other authors, that the majority (63 to 81%) of clinical isolates were E. faecalis, followed by E.faecium (13 to 23%).

Conclusion

For long time, enterococci were frequently considered to be commensally organism and were ignored when isolated in clinical laboratory. But recently due to its capability of causing variety of infections, especially in hospitalized patients, it has led to the understanding of the importance of identification to species level. Hence it is mandatory to consider enterococcal species as essentially pathogenic as they are isolated in pure culture from various clinical specimens.

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