

Short Communication

PROTOTROPHIC VARIANTS OF SALMONELLA TYPHI FROM SOUTH KARNATAKA AND THEIR ANTIBIOGRAM

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The nutritional requirements of *Salmonella typhi* has been adequately studied¹. It was the observation that certain *S. typhi* strains grew abundantly in medium where majority of strains grew moderately, that led to the discovery of the prototrophic variants of *S. typhi*². These strains unlike the tryptophan auxotrophs could grow in minimal medium without tryptophan. Subsequently, prototrophy has been recognized as an additional epidemiological marker of *S. typhi*. Phage types and drug resistance pattern of *S. typhi* isolates from South Karnataka has been studied earlier^{3,4}. However the prevalence of prototrophic strains in this region and their drug resistance of pattern remains unexplored. The aim of the study was to assess the prevalence of prototrophic strains *S. typhi* in South Karnataka and study their antimicrobial susceptibility pattern.

A total of 192 isolates of *S. typhi* from blood culture were used in the study⁵. The experiments were carried out using minimal essential medium². The medium was prepared using analytical grade chemicals (Hi-Media, Mumbai) and was sterilised by membrane filtration.

The bacteria were grown on nutrient agar at 37° C for 24 h. The cells were washed three times using sterile physiological saline. The washed cells were suspended in saline to get an optical density of 0.4 at 540 nm (approx 5x10⁷ cells/ml; confirmed by

surface plating). Ten ml of minimal medium was inoculated with 0.01 ml of bacterial suspension and incubated at 37°c in rotary water bath for 5 days. Growth was monitored at timely intervals by measuring the optical density using a spectrophotometer (Spectronic 20 D) at a wave length of 600 nm. Viable bacterial count was determined by surface plate method. The bacteria that could grow in minimal essential medium were considered prototrophs.

Antibiotic sensitivity pattern of the prototrophs was studied by disc diffusion method⁶. *Escherichia coli* NCTC 10418 was used as the control.

Of 192 *S. typhi* strains studied 17 (8.85%) were tryptophan prototrophs. We found that these strains had a long lag phase in the minimal essential medium. Antibiotic sensitivity testing of the prototrophs showed that 5 strains were sensitive to wards all the drugs tested. While 6 of the prototrophic isolates were resistant to a single drug, 4 remained resistant to any of the two drugs tested. Multidrug resistance was observed in two isolates only. All prototrophic strains were sensitive to ceftriaxone, ciprofloxacin and gentamicin. (Table1)

Typhoid remains unabated in many parts of India including South Karnataka. Previously we have used biotyping, phage typing and antibiogram for the epidemiological study of *S. typhi* in this

Table 1. Antibiotic sensitivity pattern of prototrophic variants of *S. typhi*

No. of strains	A	C	Cef	Cf	Co	G	T
5	S	S	S	S	S	S	S
4	S	R	S	S	S	S	S
2	S	S	S	S	R	S	S
3	R	R	S	S	S	S	S
1	S	R	S	S	S	S	R
1	R	R	S	S	R	S	S
1	S	R	S	S	R	S	R

A- Ampicillin,
 Cf- Ciprofloxacin,
 T-Tetracycline,

C- Chloramphenicol,
 Co- Cotrimoxazole,
 S- Sensitive,

Cef- Ceftriaxone,
 G- Gentamicin,
 R- Resistant

region^{3,4}. It is for the first time we have tried to exploit prototrophy as an additional marker.

Multidrug resistant *S. typhi* remains a major therapeutic concern especially in the developing countries like India. Previous studies conducted in this region have shown that majority of *S. typhi* strains isolated from this region are multidrug resistant^{3,4}. An important aspect noticed during the present study was the remarkable degree of sensitivity exhibited by prototrophic strains to the common drugs used in the treatment of typhoid. Detailed studies are required to link prototrophy with increased susceptibility to antibiotics.

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