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Data Article

Data showing phenotypic profile of uropathogenic *Escherichia coli* isolates from sepsis patients

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ABSTRACT

Bacterial virulence factors (VFs) influence the site and severity of urinary tract infections (UTI) and further leading to sepsis infection. Phenotypic characterisation of VFs specific to sepsis *Escherichia coli* strains has not been characterized in Indian population till date. In this data article, we have described important VFs of uropathogenic *E. coli* (UPEC) that is P fim, Type-1 fim, cell surface hydrophobicity, mannose resistant haemagglutination/mannose sensitive haemagglutination (MRHA/MSHA) expression and α-haemolysin production. The data includes a profile of the five VFs investigated in *E. coli* isolates from sepsis patients ($N=78$) and control group ($N=50$) from non-sepsis subjects. We found that P fim phenotype was expressed in 25.3% of *E. coli* isolates from sepsis patients, whereas Type-1 fimbriae was detected in 30.5%. Cell surface hydrophobicity phenotype was present in 30.5%, α-haemolysin in 26.3% and MRHA/MSHA in 22.1% of sepsis *E. coli* isolates. None of the control *E. coli* isolates showed presence of these phenotypes. The combined phenotypic profile of all the five VFs was significantly higher in sepsis patients as compared to the control group.

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Specifications table

Subject area	*Biology*
More specific subject area	*Medical microbiology, E. coli*
Type of data	*Graphs*
How data was acquired	*Phenotypic assay of E. coli strains*
Data format	*Analyzed*
Experimental factors	*Confirmed sepsis patients*
Experimental features	*Phenotypic profile of E. coli isolates from Sepsis patients*
Data source location	*New Delhi, India*
Data accessibility	*Data is with this article only*

Value of the data

- First report of phenotypic profile of the uropathogenic *Escherichia coli* isolates from sepsis patients in the Indian population.
- The data showed that P fim and Type-1 fimbriae phenotype were highly expressed in *E. coli* isolates from sepsis patients, indicating their important role in adherence.
- A high expression of α-haemolysin in the *E. coli* isolates is indicative of induction of toxicity.
- Information of the phenotypic profile of the sepsis patients in response to *E. coli* infection can be helpful in understanding the role of VFs in adherence to host epithelial cells and induction of toxicity among such patients.

1. Data

The phenotypic profiling of important virulence factors (VFs) have shown that P fim phenotype was expressed in 25.26% of *E. coli* isolates of the sepsis patients, whereas Type-1 fimbriae was expressed in 30.52% of *E. coli* isolates by haemagglutination (Fig. 1A). The expression of P fim and Type 1 fimbriae was significantly higher in sepsis *E. coli* isolates as compared to control group ($p < 0.01$). Cell surface hydrophobicity phenotype was present in 30.52% of *E. coli* isolates whereas 26.31% were expressing α-haemolysin and MRHA/MSHA phenotype was shown by 22.1% of *E. coli* sepsis isolates (Fig. 1A). Similarly, the cell surface hydrophobicity, haemolysin and mannose resistant phenotypes were significantly higher among sepsis *E. coli* isolates as compared to the control group ($p < 0.01$). Further combined expression profile of five phenotype virulence factors was significantly higher in sepsis *E. coli* isolates as compared to control group ($p < 0.001$) (Fig. 1B).

2. Experimental design, materials, and methods

2.1. Collection and culturing of clinical E. coli isolates

E. coli strains ($N = 128$; Sepsis = 78; Control = 50) were obtained from the stock library of Department of Microbiology, Vardhman Mahavir Medical College and Safdarjung hospital, New Delhi, India.

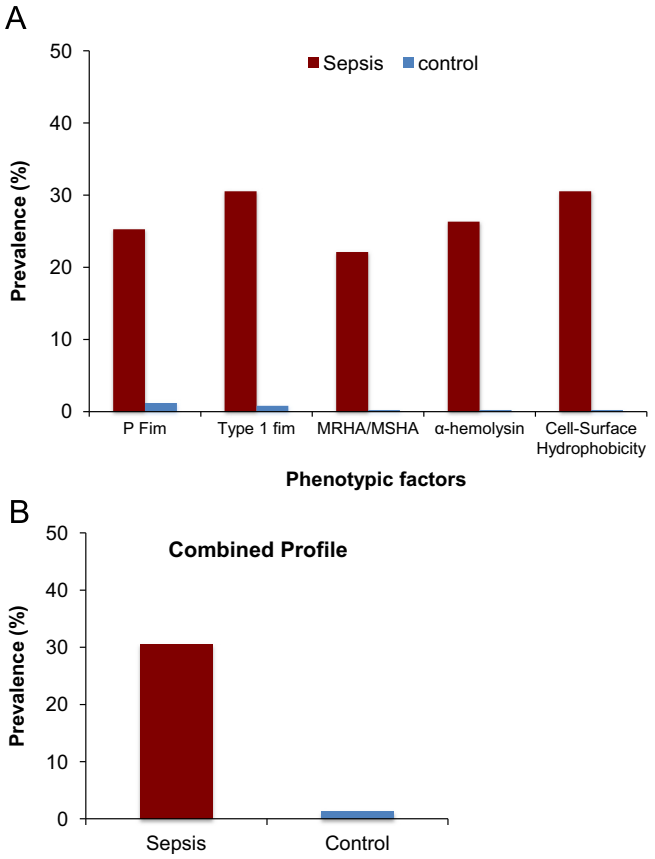

Fig. 1. (A) The phenotype profile of five important virulence factors of *E. coli* in sepsis patients and control group. (B) Combined virulence profile of sepsis *E. coli* samples as compared to control group.

The *E. coli* strains were collected from confirmed sepsis patients who visited the hospital while control group consists of the faecal *E. coli* isolates from non-sepsis controls. The bacteria were grown on tryptic soy agar (TSA) agar plates at 37 °C overnight and further stored at 4 °C for the phenotypic characterisation.

2.2. Haemagglutination assay: P-fimbrial/Type 1 fimbrial phenotype

The phenotype of P-fimbrial was defined by P blood group dependent haemagglutination [1,2]. P-fimbrial expression was defined by agglutination of P1 (receptor positive) but not p (receptor negative) erythrocytes. Type 1 fimbrial was detected by haemagglutination of human and guinea pig erythrocytes after in vitro passage in Luria broth. Agglutination was performed in the presence and absence of α-methyl-D-mannoside. Strains causing mannose-sensitive agglutination were defined as Type 1 fimbriated [3].

2.3. MRHA/MSHA assay

Haemagglutination was performed in round-bottomed microtitration plates. One drop (100 μl) of bacterial suspension was mixed with one drop of erythrocytes (human A^{+ve}, 3% v/v in 1 × PBS) and one drop of PBS, with or without D-mannose (3% w/v). The plate was left to rotate (15 rpm) for 5 min

at 25 °C followed by rotation for 5 min at 4 °C. Haemagglutination was considered to be mannose-resistant (MRHA) when it occurred in the presence of mannose and mannose-sensitive (MSHA) when it was inhibited by mannose [4].

2.4. Cell-surface hydrophobicity

The cell-surface hydrophobicity was calculated by the salt aggregation test (SAT) with suspensions (5×10^9 cfu/ml) in 0.2 M phosphate buffer, pH 6.8, of bacteria grown on TSA medium. In brief, suspensions were mixed with ammonium sulphate solutions at final molar (M) concentrations of 2.0, 1.4, 1.0, 0.4, 0.1, 0.06 and 0.02. Strains were considered to be hydrophobic when they aggregated in ammonium sulphate at concentrations ≤ 1.4 M [5].

2.5. α-Haemolysin production

Sheep blood agar plates were used for determination of α-haemolysin production that contained 1% sheep blood (v/v). About 7–8 wells of 8 mm diameter were made on blood agar plate and 50 μl of bacterial lysate was poured into wells and incubated overnight. Zone of inhibition was recorded. Strains with a clear halo after overnight culture at 37 °C were defined as haemolytic [6].

3. Statistical analysis

The chi-square test was used for statistical comparison between the two groups. P values ≤ 0.05 were considered as statistically significant.

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Appendix A. Supplementary material

Supplementary data associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.dib.2016.03.047.

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