

The continuous challenge of *Escherichia coli* infections

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Escherichia coli has been extensively studied over the last years, as testified by the significant increase in the number of publications available on line on this topic in Pub Med from 1955 to 2005. In particular, *E. coli* has been successfully used as a model organism in different experimental conditions because it is easy to take care of; it grows quickly; it can survive storage for long periods of time; it is easily available.

Since the first observation by Theodor Escherich, *E. coli*, because of its ubiquity, has been frequently studied in cellular biology and its structure has been an excellent target for novices of the life sciences. Interestingly, *E. coli* has been involved in the scientific pathway for achieving the definition of genome. Recently, it has been also observed that K5 polysaccharide from *E. coli* is able to inhibit HIV infection.

Notably, there is a role of bacterial cell surface structure in *E. coli* biofilm formation which has a profound impact in several clinical conditions.

One emerging problem of great interest and concern is the development of MDR – *E. coli* producing extended – spectrum beta-lactamases (ESBL). In general, ESBL – *E. coli* isolates require special diagnostic identification and they are variably susceptible to beta-lactam/beta-lactamase inhibitor, fluoroquinolones, carbapenems.

A five year survey on blood stream infections (BSI) caused by *E. coli* in a large university hospital in Rome, Italy indicated that the percentage of ESBL-producing strains increased from 7 % in 1999 to 17 % in 2003. The large majority of BSI caused by ESBL-producing strains of *E. coli* was isolated in Medicine and Surgery, while they were less frequently observed in ICU. In addition to isolates producing TEM and SHV, there was also a significant number of isolates producing CTX-M and CTX-M/ TEM/SHV.

The clinical aspects of *E. coli* infections include: UTI in men and women, neonatal meningitis and sepsis, the impact of ESBL – producing strains.

Among the global examples of emerging and re-emerging diseases, there is *E. coli* enterohemorrhagic - EHEC – O157: H7. This infection is characterized by diarrhea (often bloody) and abdominal cramps. It can be complicated by hemolytic uremic syndrome and thrombocytopenic purpura.