Resistance to Oral Antibiotics among Urinary Tract Infection Isolates of Escherichia coli from the United States and Europe in 2017

I.A. Critchley\textsuperscript{1}, N. Cotroneo\textsuperscript{1}, K. A. Sulham\textsuperscript{1}, D. Melnick\textsuperscript{1}, R. Mendes\textsuperscript{2}

\textsuperscript{1}Spero Therapeutics, Cambridge, MA, \textsuperscript{2}JMI Laboratories, North Liberty, IA

\textbf{ABSTRACT}

\textbf{INTRODUCTION}

Escherichia coli is the most prevalent pathogen associated with urinary tract infections (UTIs). Oral antibiotics including the cephalosporins, fluoroquinolones and trimethoprim-sulfamethoxazole (TMP-SMX) have been historically used to manage urinary tract infections (UTIs) caused by \textit{Escherichia coli} (EC). The utility of these agents continues to be eroded by the increased prevalence of expanded spectrum \textit{\beta}-lactamase (ESBL) genes and concomitant resistance to CEF, LEV and TMP-SMX noted in 100%, 82.6% and 70.7%, respectively. All CTX-M-15 infections (UTIs) caused by \textit{Escherichia coli} from UTIs in the US and EU in 2017 in the SENTRY Surveillance program would address and unmet need to new options to treat multi-drug-resistant EC UTIs.

\begin{itemize}
  \item Among the 2422 UTI isolates of \textit{E. coli} resistance to FQs were 28.1% and 27.4%, respectively, for ciprofloxacin and levofloxacin.
  \item Overall prevalence of ESBL phenotypes among \textit{E. coli} was 18.2% (18.7%) in the US and 20.1% in the EU.
  \item Among the 411 ESBL phenotypes, R to both levofloxacin and TMP-SMX exhibited high co-resistance to cefuroxime (49.5%) and TMP-SMX (56.2%).
\end{itemize}

\textbf{METHODS}

\begin{itemize}
  \item All isolates were consecutively collected and centrally evaluated for susceptibility to various agents.
  \item Isolates that met ESBL MIC screening criteria were characterized for the presence of \textit{\beta}-lactamase genes.
\end{itemize}

\textbf{CONCLUSIONS}

\begin{itemize}
  \item Among the 2422 UTI isolates of \textit{E. coli} resistance to FQs were 28.1% and 27.4%, respectively, for ciprofloxacin and levofloxacin.
  \item Overall prevalence of ESBL phenotypes among \textit{E. coli} was 18.2% (18.7%) in the US and 20.1% in the EU.
  \item Among the 411 ESBL phenotypes, R to both levofloxacin and TMP-SMX exhibited high co-resistance to cefuroxime (49.5%) and TMP-SMX (56.2%).
  \item The carbapenems retained high co-resistance to cefuroxime (49.5%) and TMP-SMX (56.2%).
\end{itemize}