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Characterization of CTX-M-type-extended-spectrum beta-lactamase (ESBL)-producing Enterobacteriaceae isolated from Indonesian undergraduate medical students of a university in Surabaya, Indonesia

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Abstract

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Characterization of CTX-M-type-extended-spectrum beta-lactamase (ESBL)-producing *Enterobacteriaceae* isolated from Indonesian undergraduate medical students of a university in Surabaya, Indonesia

Name

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Abstract

Background. *Enterobacteriaceae* isolates producing CTX-M-type extended-spectrum β -lactamase (ESBL) has been found in hospitalized patients and healthy individuals in communities of the Southeast Asian countries. Medical students might have more risk of ESBL-producing *Enterobacteriaceae* contagion, because medical students who belong to communities have direct and indirect contacts with workers and patients in healthcare facilities. **Aim.** The aim of this study was to collect information for evaluation of the potential risk of ESBL-producing *Enterobacteriaceae* contagion in Indonesian undergraduate medical students by characterizing genotypic properties of *Escherichia coli* isolates-producing CTX-M-type ESBL. **Method.** A total 141 fecal samples collected from 207 medical students of a university in Surabaya, Indonesia were subjected to PCR, XbaI and S1 nuclease-pulsed-field gel electrophoresis (PFGE), Southern blotting, and sequencing analysis. **Result.** Eighty-two ESBL-producing *Enterobacteriaceae*, including 75 *E. coli* and 7 *Klebsiella pneumoniae* were isolated from 79 (56.0%) students. Among 75 ESBL-producing *E. coli*, *bla*_{CTX-M-15} was the most prevalent type (44.0%). Although XbaI-PFGE results showed genetic background of the *E. coli* isolates producing CTX-M-type ESBL were diverse, five clonal spread cases of certain *E. coli* producing CTX-M-type ESBL isolates were observed among the medical students. **Conclusion.** Our results suggested that ESBL-producing *Enterobacteriaceae* might be circulating among the medical students through contaminated environment such as in a university or communities they belonged.

Keywords

ESBL-producing *Enterobacteriaceae*; Medical student; clonal