ABSTRACT

Chronic wound infections significantly strain healthcare systems and often delay healing due to the presence of multidrug-resistant (MDR) bacteria. With the rise of resistance to last-line antibiotics like colistin, accurate susceptibility testing has become essential but presents challenges, particularly with MDR isolates. This study aimed to evaluate the Minimum Inhibitory Concentration (MIC) of colistin against MDR bacterial isolates from chronic wound specimens using the gradient E-strip method, a widely used technique for determining antibiotic susceptibility. A total of 50 wound specimens were analyzed, with 34 (68%) isolates identified as MDR and 16 (32%) as non-MDR. Only MDR isolates were included in the colistin susceptibility testing. Among the isolates, 19 *Pseudomonas aeruginosa* were identified, of which 14 (41%) were classified as MDR, with MIC values ranging from 0.5 to 6 µg/mL. Similarly, out of 12 *Klebsiella pneumoniae* isolates, 10 (29%) were classified as MDR. Four of these resistant *Klebsiella* strains exhibited exceptionally high MIC values: two strains with MICs of 6 µg/mL, one strain with an MIC of 8 µg/mL, and another with an MIC of 12 µg/mL. This significant proportion of resistant *Klebsiella pneumoniae* isolates reflects the growing global trend of antibiotic resistance, driven by the production of extended-spectrum beta-lactamases (ESBL) and carbapenemases. Three specimens yielded *Escherichia coli,* and 1 (3%) was MDR. Three *Methicillin-Sensitive Staphylococcus aureus (MSSA)* isolates were non-MR, while all three *Methicillin Resistant Staphylococcus aureus (MRSA)* isolates were MDR. Five isolates were MDR (9%). One isolate was MDR, and one was non-MDR, identified as *Proteus mirabilis*. Some *Proteus* species' inherent resistance to colistin eliminated them from inclusion in colistin susceptibility testing. Moreover, colistin lacks activity against Gram-positive bacteria, including *Staphylococcus aureus,* for which susceptibility evaluation is inappropriate. This study emphasizes the alarming frequency of MDR bacteria in chronic wound infections—*Pseudomonas aeruginosa* and *Klebsiella pneumonia*—and these isolates' fascinating diversity of susceptibilities to colistin. The MIC results reported show the struggle with treating MDR infections with colistin, mainly when the bacteria show resistance or reduced sensitivity. These results facilitate the critical need to continue monitoring for colistin resistance in clinical settings and the development of alternative treatment regimens to combat MDR infections.