Impact of MALDI-TOF Will Be Highly Dependent on the Clinician

To the Editor—Clerc et al recently reported a real-life use of matrix-assisted laser desorption ionization time-of-flight mass spectrometry (MALDI-TOF) to optimize the choice of antibiotherapy for bloodstream infections [1]. The advent of MALDI-TOF triggered numerous articles and great hopes about how it would change the organization of microbiology laboratories. However, little is known about its impact on infectious diseases (ID) specialists’ clinical practice or on antimicrobial stewardship. Therefore, we acknowledge and congratulate the authors for being one of the few groups of investigators to study the impact of MALDI-TOF on clinical practice.

However, the authors chose to focus on gram-negative bacteria because MALDI-TOF is less reliable for gram-positive...
and encapsulated bacteria [2]. This choice is highly disputable in terms of practical evaluation of a technique for clinical purposes, since it eliminates its underperforming components. Choices of successive antibiotic therapies were assessed by the clinical microbiologist. However, it is unclear whether all antibiotic therapies were chosen by ID specialists or whether they were chosen by the primary teams before ID specialists were involved in those cases. This could be an important confounder of the assessment of empirical antibiotic therapies. In fact, studies have shown that the choice of antibiotic by ID physicians, compared to those by physicians with other specialties, differed in 50% cases [3] and that their choice tended to be more appropriate, targeting a narrower spectrum [4]. Therefore, assessment of MALDI-TOF’s impact could be questionable if there was a bias in the appropriateness of the initial regimen.

Furthermore, the impact of MALDI-TOF on empirical antibiotic therapy was compared with the impact of Gram-stain findings. Although we agree with the appropriateness of this choice as the main end point of the study, we believe that the methods would have been greatly improved by using a before-and-after study design. Here, the assessment appears to be flawed because the MALDI-TOF reporting occurred 1 hour after Gram-stain findings were reported. Therefore, it is conceivable that some physicians waited for MALDI-TOF findings were reported before making changes to a current antibiotic therapy or starting a new agent, because they knew that more-precise information would be available an hour later. In fact, almost 10% of patients had their empirical antibiotic therapy introduced after MALDI-TOF findings were reported, despite the fact that Gram-stain findings were reported earlier. The lack of information about the percentage of the patients treated by antibiotics before the report of Gram-stain findings and about the appropriateness of empirical antibiotic therapies makes it difficult to assess the real impact of MALDI-TOF. Thus, suggesting that MALDI-TOF had an impact on empirical therapy for 35.1% of bacteremias is probably far too optimistic. The real impact may be closer to the value of 11.3% reported by Vlek et al [5].

It is also important to notice that the above-mentioned studies came from the Netherlands and Switzerland, 2 countries with a low prevalence of extended-spectrum β-lactamase (ESBL) production among Enterobacteriaceae and a greater discipline with regard to antimicrobial stewardship. Therefore, the impact of MALDI-TOF could be stronger in the context of a higher ESBL prevalence. More studies are required to assess the real impact of this tool on antimicrobial choice.

**Note**

**Potential conflicts of interest.** All authors: No reported conflicts.

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