DIRECT IDENTIFICATION OF URINARY TRACT PATHOGENS FROM URINE SAMPLES BY MALDI-TOF (Matrix-Assisted Laser Desorption Ionization Time-of-Flight) MASS SPECTROMETRY.

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MALDI-TOF mass spectrometry has been suggested as a reliable method for bacterial identification from cultures. Direct analysis of clinical samples might increase the usefulness of this method, shortening the time for microorganism identification.

We compared conventional methods for the diagnosis of urinary tract infections (UTI) and identification of the urinary tract pathogens (automated screening, plate cultures and identification based on biochemical characteristics) and a fast method based on conventional screening and MALDI-TOF MS. For this latter method, 4 ml of urine were centrifuged under a low revolutions regime (2,000 g) to remove leukocytes and then at high revolutions (15,500 g) to collect bacteria. The pellet was washed, and then applied directly to the MALDI-TOF plate. Two-hundred and sixty urine samples, detected as positive by the screening device (UF1000i), were processed by culture and MALDI-TOF MS. Twenty samples were positive in the screening device, but negative in culture, and all of them were also negative in MALDI-TOF MS. Two-hundred and thirty five samples displayed significant growth of a single morphological type in culture. Two-hundred and twenty of them showed bacterial growth >10(5) CFU/ml.

Microorganism identifications in this group were coincident at species level in 202 cases (91.8%), and at genus level in 204 cases (92.7%). The most frequent microorganism was Escherichia coli (173 isolates). MALDI-TOF MS identified this microorganism directly from the urine sample in 163 cases (94.2%). Our results show that MALDI-TOF MS allows bacterial identification directly from infected urine in a short time, with high accuracy, and especially when Gram-negative bacteria with high bacterial counts are involved.