

Rapid Identification by MALDITOF of *Neisseria elongata* Subspecies *nitroreducens* in an Endocarditis Case.

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Abstract:

Neisseria elongata subspecies *nitroreducens* is a foremost pathogen responsible for infective endocarditis, even if it is infrequently reported. We compile the first case of endocarditis in Italy due to *N. elongata* subsp. *nitroreducens*.

N. elongata subsp. *nitroreducens*, a commensal of human nasopharyngeal, has been known as responsible for endocarditis cases. Among the three *N. elongata* subspecies, *N. elongata* subsp. *elongate*, subsp. *glycolytica* and subsp. *nitroreducens*, the subsp. *nitroreducens* has been restore most frequently in cases of *N. elongata* endocarditis. The infection is often associated with acute febrile endocarditis with large vegetation and a destructive process that frequently causes severe cardiac disease as well as various systemic complications.

The recent report of cases of infective endocarditis linked to *N. elongata* subsp. *nitroreducens* responsibility in patients without any serious underlying diseases raise the pathogenic infective role of the microorganism.

Since serious complications to microorganism infection have been described, even though no data associated with death have been reported, a close follow-up of these cases should be managed.

On admission, the patient's blood pressure was 130/60 mmHg, his pulse rate was 100 beats per minute. His abdomen was soft and mildly tender in response to palpation throughout, without rebound. His laboratory results were notable for white blood cell count of $7.15 \times 10^3/\mu\text{L}$ with 89.6% polymorph nuclear cells, 4.1% lymphocytes, 0.6% monocytes, 0.3% eosinophil and a hemoglobin level of 14.2 g/dL. Blood tests demonstrated elevation of C-reactive protein >74.9 mg/dL, creatinine phosphokinase < 33 U/L and lactate dehydrogenase 485 U/L. A trans esophageal echocardiogram (TEE) showed an echo lucent zone around the graft and vegetation on the prosthetic valve. Three sets of blood cultures were performed (BD BACTEC plus Aerobic/F, Plus Anaerobic/F and Mycosis-IC/F, BACTECTM Becton Dickson).

To know the three positive sets of blood culture, the Bruker Sepsityper kit (Bruker Daltonics, Germany) was used according to the manual of instruction, and proteins were extracted using

equal volumes of 70% acetonitrile and formic acid. The extracts were centrifuged (10,000 x g, 2 min), and final supernatants were spotted onto a 96-well ground steel target plate and overlaid with 1 μL of α -cyano-4-hydroxycinnamic acid matrix solution (both from Bruker Daltonics, Germany). After drying, samples were subjected to analysis using a Bruker Auto flex speed system according to the manufacturer's recommendations. The resulting spectra were analyzed with Bruker Biotype 3.0 software using a reference spectrum library with bloodculture-specific parameters that excluded mass peaks with m/z ratios of <4,000. Identification scores of 1.6 to <1.8 were considered valid to the genus level, scores of 1.8 to 3.0 were considered valid to the species level, while scores of ≤ 1.6 were considered invalid [9]. The bacterium was identified as *N. elongata* subsp. *nitroreducens* with a score of 2.07.

The microorganism showed reduced sensitivity to Clindamycin but was fully sensitive to Cefalotin, Cefotaxime, Ceftazidime, Ciprofloxacin, Cloramphenicol, Gentamicin, Ofloxacin, Tetraciline and Trimethoprim/Sulfamethoxazole.

Soon after administration of targeted therapy (Ceftazidime 2 g every 8 hours and Gentamicin 80 mg every 8 hours) the patient became afebrile and he remained so throughout the entire clinical course; the C reactive protein level greatly decreased.

After clinical and laboratory remission, on hospital day 21 the patient was discharged in good condition. The antibiotic therapy (intramuscular Gentamicin and intramuscular Ceftazidime) was continued at home for other three weeks.

A transthoracic echocardiography, performed one month after hospital discharge, showed complete resolution of the vegetation.

To the best of our knowledge, more than 20 cases of *N. elongata* endocarditis have appeared in the literature; we present the first case of endocarditis in Italy due to *N. elongata* subsp. *nitroreducens* and its identification in a short time by MALDI-TOF.

Keywords: MALDI-TOF; *Neisseria elongate*; Endocarditis