

The electrophysiological examination of polyneuropathy in Europe and the influence of medical audit

Hatice Tankisi

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Official opponents: Christian Krarup, Søren Sindrup and Johannes Jakobsen.

Tutors: Anders Fuglsang-Frederiksen and Birger Johnsen.

Correspondence: Hatice Tankisi, Klinisk Neurofysiologisk Afdeling, Aarhus Sygehus, Nørrebrogade 44, 8000 Aarhus C, Denmark.

E-mail: htank@as.aaa.dk

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ABSTRACT

This PhD study was carried out at the Department of Clinical Neurophysiology, Aarhus University Hospital. In this study polyneuropathy (PNP) cases were evaluated in order to examine variations in electrodiagnostic examination, diagnosing and classification of PNPs among European physicians, and to determine whether medical audit in an international collaboration of peers could change physicians' electrodiagnostic practice.

This study was based on the data from the European multicentre project ESTEEM (European Standardized Telematic tool to Evaluate EMG knowledge-based systems and methods), with participation from six European EMG laboratories. Since 1992, the physicians have collected samples of their electrodiagnostic examinations via the Internet into a common database for interpretation by each physician and peer review at regular workshop meetings. The ESTEEM database now comprises 1401 cases of different disorders, of which 467 have reached a consensus diagnosis. This study focuses on PNP cases representing the largest group in the consensus database.

Analysis of 156 prospectively collected PNP cases showed large differences among the ESTEEM physicians regarding classification of mixed and axonal PNPs. In contrast, there was good agreement on demyelinating PNPs.

Regarding the influence of medical audit, each physician's first 12 cases of PNPs (set 1: total 81 cases) were compared with the last 12 cases (set 2: total 83 cases) to determine whether international collaboration of peers could change electrodiagnostic practice. Increased agreements were shown on the pathophysiological interpretation of examinations, on the number of abnormal structures necessary to give a PNP diagnosis and on the pathophysiological classification of PNPs.

Although some interlaboratory differences still persisted, the changes from set 1 to set 2 towards more homogeneous electrodiagnostic practices suggest an impact of several years of international collaboration. The results suggested that common criteria for demyelinating PNPs have been followed by all seven physicians in daily routine examinations during the ESTEEM project. This may be because the criteria for demyelination are relatively well defined. In contrast, the variations in classification of axonal and mixed PNPs that did not change during medical audit may indicate a lack of criteria in these classifications.

These results induced the ESTEEM group to suggest guidelines

for electrodiagnosis of PNPs based on systematic examination of patient cases, knowledge of variation studies, several years of collaboration, discussion at consensus meetings, physicians' individual and shared experiences, and the literature.

This study is of particular interest, in that recognizing the variations and then suggesting standards of good clinical practice developed by international collaboration may increase the quality of electrodiagnostic practice.