A Retrospective Pilot Study Assessing the Concordance Between Referral Diagnoses, Referring physician Specialty, and EMG/NCV Results

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Introduction

- Electromyoneurography (EMG/NCV) combines nerve conduction studies and needle electromyography.[1] Patients are referred with a diagnostic hypothesis to be tested.
- Nerve conduction studies assess large myelinated fibers, and needle EMG evaluates type I muscle fibers. Conditions affecting small fibers (e.g., neuropathic pain) or type II fibers (e.g., steroid myopathy) typically yield normal results, limiting the utility of EMG/NCV for their evaluation.[1,2,3]
- Moreover, many patients are referred for EMG/NCV testing for nonspecific symptoms such as pain or numbness, often without objective neurological deficits.
- This study was conducted to determine the concordance of the EMG referral with the provider's specialty and the final EMG diagnosis as the gold standard.

Aims and Objectives

1. To determine if there is a statistically significant difference between the referring diagnosis and the ultimate EMG/NCV diagnosis
2. To determine if there is a statistically significant difference between physician specialties with respect to the accuracy of the clinical diagnosis as determined by EMG/NCV.

Methods

- Retrospective chart review, looking at 59 patients referred for an EMG/NCV
- Patients were grouped by an anatomical diagnosis, (e.g. ulnar neuropathy) or a symptom based diagnosis, (e.g. "numbness"). Among those referred with an anatomical diagnosis, EMG/NCV results were classified as positive (i.e. confirmatory) or negative. Chi-square testing was used to assess for statistical significance at a 95% confidence interval between the clinical diagnosis and EMG/NCV diagnosis
- The referring providers were sub grouped by specialty to determine if certain specialties were more likely to submit an anatomical diagnosis and if these diagnoses were more likely to be concordant with the ultimate EMG diagnosis. The independent variables assessed are the different specialties of the referring provider and the dependent variable is the physician specialties that had a higher accuracy of correct diagnosis as assessed by EMG/NCV.

Results

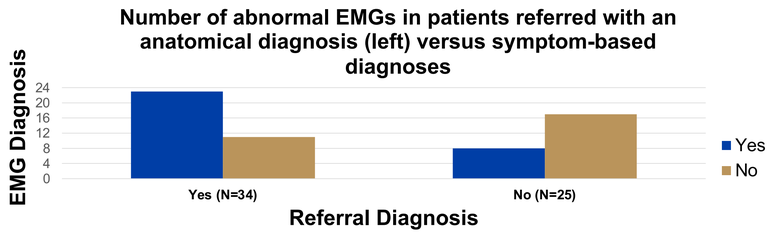

Figure 1: Depicts abnormal (yes) or negative (no) EMG findings in association with patients referred for EMG/NCVs. The was a statistically significant difference between anatomical and symptom-based diagnoses as assessed by an abnormal EMG, (P<0.01). Overall, there were 31 (52.5%) abnormal EMG results. Within the 34 referred with an anatomical diagnosis, there were 23 (67.6%) abnormal EMG studies, whereas in the 25 symptom-based diagnosis group there were 8 (32.0%) with an abnormal EMG.

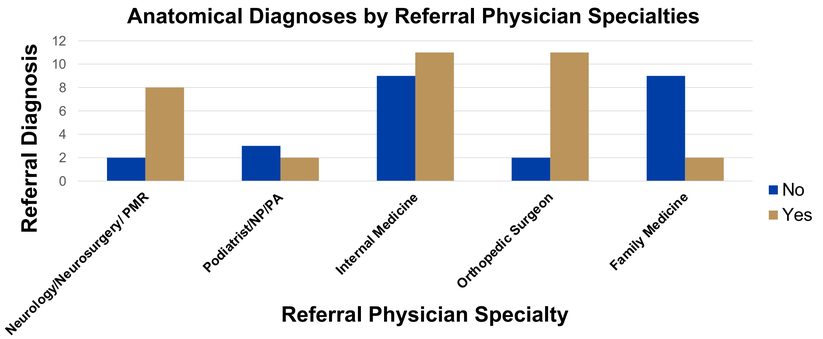

Figure 2: Depicts an anatomical referring diagnosis (yes) or symptom based diagnosis (no) in association with different referral specialties. Neurology, Neurosurgery, and PM&R [NNP] were grouped together as the neurological specialties. Podiatry, nurse practitioners (NP), and physician's assistants (PA) were also grouped together. Fisher's exact testing revealed a statistically significant difference between specialists in that NNP and orthopedic surgery were most likely to provide an anatomical diagnosis to be tested as compared to other specialties, (p<0.01).. Overall, from the neurological specialty group there were 8 out of 10 anatomical referring diagnoses (80%) and 11 out of 13 (85%) from the orthopedic surgeons.

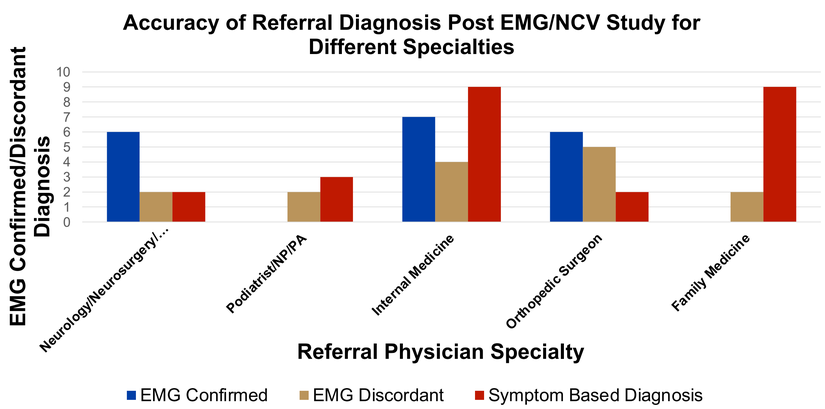

Figure 3: Depicts the probability of an abnormal EMG/NCV study when comparing different specialties. association with different referral physician specialties. Fisher's exact testing was non-significant (p=0.21). Notably, in this study, podiatry/NP/PA and family medicine group tended to provide symptom- based diagnoses. When an anatomical diagnosis was provided in this group, none of these had an abnormal EMG/NCV.

Conclusions

- The study demonstrated that patients referred with an anatomical diagnosis were more likely to have a confirmatory EMG/NCV study.
- Orthopedic surgeons and those in the neuroscientist specialties (neurologist, neurosurgeons, and PM&R) are more likely to refer a patient with an anatomically based diagnosis. However, these specialties are not more likely to have an EMG confirm the diagnosis than the other specialties evaluated.
- Symptom based diagnoses are unlikely to yield an abnormal EMG/NCV such that these referrals should be less frequent.
- Based on these results, it is recommend that providers hypothesize an anatomically based diagnosis when electrodiagnostic (EMG/NCV) testing will impact the patient's clinical management.
- Limitations of this study include retrospective data analysis, small sample size and utilizing EMG/NCV as the "gold standard" for diagnosis.
- Future investigations would include a prospective evaluation, a larger sample size, and expanding the range of referring providers' specialties.

References

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