

Big Data

IHC-PO-241

Migraine comorbidity and phenotypic disease networks in occupational health care

Minna A. Korolainen^{*1}, Samu Kurki², Samuli Tuominen³, Iiro Toppila³, Mariann I. Lassenius³, Jaana Santaholma¹, Timo Purmonen¹, Markku Nissilä²

¹Novartis Finland, Espoo, ²Terveystalo Biobank Finland, Turku, ³Medaffcon, Espoo, Finland

Objective: Migraine is related to significant burden with respect to health care visits and sick leave days compared to a control population [1]. The objective was to examine the ICD-10 coded diseases for migraine patients.

Methods: Data were collected through the follow-up period from 1st January 2012 to 31st December 2017. Electronic medical records of 17 623 patients with migraine (G43) were included in the retrospective analyses. An age and gender matched control population was created for comparison. The pairwise Pearson correlations between the diagnosis codes were calculated as previously described, and used to draw phenotypic disease networks (PDN) to visually assess the morbidity [2]. An automatic subnetwork detection algorithm was used to group comorbid diagnoses.

Results: Migraine patients had 1.7-fold increase in the mean number of diagnoses compared to controls. Altogether, 1337 ICD-10 codes were detected but only 10% (n=136) were present in more than 2% of the migraine patients. Among these, over 2-fold increase in the frequency of ICD-10 codes was detected in migraine patients compared to controls for headache and related syndromes (R51, G44), visual and ear disturbances (H53, H81), nausea and vomiting (R11), dizziness (R42), viral and other intestinal infections (A08), dorsopathies (M50, M53) as well as for injuries (S30, S33, S06, S13). The network analysis showed ICD-10 codes pertaining to etiologically related diseases appearing close to each other in the network. Expected clusters of diagnosis codes were found in the PDNs, including a cluster of mental health and sleep related (F32, F41, F43 and F51) as well as a cluster of injury related diagnosis codes (multiple M- and S- codes).

Conclusion: Migraine patients showed increased morbidity detected by the frequencies of ICD-10 codes when compared to controls. Diagnoses of etiologically related diseases appeared close to each other in network analyses. Comparing the PDNs drawn for the migraine patients and the control population showed further evidence for migraine-specific propensity to a wide array of diseases.

1. Korolainen et al. J Headache Pain. 2019 Feb 12; 20(1):13.
2. Hidalgo et al. PLoS Comput Biol. 2009 Apr 5(4):e1000353.

Disclosure of Interests: MAK, JS and TP are employed by Novartis.