

P146

P146 -Multi-morbidity patterns in patients with non-dialysis chronic kidney disease across England: a multi-centre cluster analysis

Dr Thomas Wilkinson¹, Dr Amy Clarke¹, Professor Alice Smith¹

¹*Leicester Kidney Lifestyle Team, University Of Leicester, Leicester, United Kingdom*

Purpose:

One of the most important tasks in clinical medicine today is managing multi-morbidity, i.e. the co-occurrence of two or more chronic medical conditions within a person. In the UK, an estimated 23% of the general population has ≥ 2 chronic conditions making multi-morbidity extremely costly to health-care systems [1]. The effects, and thus treatment of, multiple chronic conditions in an individual are complex. Consequently, enhanced understanding of the patterns of chronic-disease clustering would help to improve the management of multimorbid patients and to define better-adapted treatment guidelines [1,2].

Cluster analysis is increasingly used to identify clinically relevant multi-morbidity groups, however, to our knowledge, investigation of multi-morbidity clusters exclusively patients with chronic kidney disease (CKD) has not been performed. Using data from a large multi-centre study, we aimed to identify multi-morbidity patterns in patients with non-dialysis dependent CKD.

Method:

Occurrence of multi-morbidities in 1396 CKD patients (55% females, mean age, 63 (SD: 18) years, eGFR, 38 (SD: 23) ml/min/1.73m²) across nine centres in England were assessed. Conditions were classed as binary variables (i.e. apparent and non-apparent) and cluster analysis [average linkage (between groups) squared Euclidean distance] was used to visualize multi-morbidity patterns in a dendrogram and proximity matrix table. Clusters were determined at a combine distance cut-off of 7.5.

Results:

Excluding the presence of CKD, the average additional morbidities were 1.8 (min: 0, max: 7). 738 patients (53%) had ≥ 2 additional morbidities and 388 patients (28%) had ≥ 3 . In order of frequency, morbidities were as follows: hypertension (n=949, 68%), diabetes (n=405, 29%), MSK, (n=333, 24%), ischemic heart disease (IHD) (n=322, 23%), chronic obstructive pulmonary disease (COPD) (n=179, 13%), mental health conditions (n=113, 8%), stroke/ transient ischemic attack (TIA) (n=90, 7%), peripheral vascular disease (PVD) (n=71, 5%), (other) neurological conditions (n=53, 4%). The most common pairing of morbidities was hypertension and diabetes (n=328, 23% with both).

Five cluster patterns were identified from the dendrogram (Figure 1). In cluster 1, a distinct 'neurovascular' sub-cluster (PVD, neurological, stroke/TIA) was identified. IHD, MSK, diabetes, and hypertension formed individual clusters (2 to 5).

Hypertension was linked most closely with diabetes (proximity matrix distance .715), whilst the presence of IHD was linked with PVD (.256) and stroke/TIA (.267). Mental health conditions were closely linked with (other) neurological conditions (.032).

Conclusions:

Even excluding the presence of CKD, our data reveals over 50% of CKD patients have ≥ 2 additional morbidities. We provide first evidence of how these additional multi-morbidities cluster together in CKD. Conditions of PVD, neurological, stroke/TIA are likely to co-exist, alongside mental health conditions and

COPD. Previous research in the US and Europe has identified clustering of mental health with both neurological diseases and COPD [2,3]. IHD, MSK, diabetes, and hypertension existed relatively separately as morbidities in CKD. Cluster analysis is a useful technique for identifying patterns of multi-morbidity in CKD. Further research is needed to identify differences across disease stage/type, and the effect on clinical outcomes.