

## Muscle symptom burden: differences between non-dialysis CKD patients and non-CKD adults

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### Background

Patients with chronic kidney disease (CKD) may experience more severe muscle related-symptoms than non-CKD adults. These symptoms present themselves in the form of muscle weakness or tiredness and muscle pain. Other symptoms associated with musculature could include cramps or restless legs. The impact of these symptoms on activities of daily living (ADLs) is well known in a non-CKD population however, how individuals with CKD experience these symptoms is not well defined. This comparative study investigated the severity and impact of these symptoms amongst CKD patients and non-CKD adults.

### Methods

347 non-dialysis CKD patients (males: 53% age: 63.8 ( $\pm$ 17.4) years, eGFR: 33.1 ( $\pm$ 20.1) ml/min/1.73 m<sup>2</sup>) and 306 non-CKD adults (males: 28%, age: 46.7 ( $\pm$ 16.4) years) were asked to fill out a bespoke questionnaire. The questionnaire used a Likert scale (0-10), where 0 indicated 'no symptoms' while 10 indicated 'severe symptoms'. Six items assessed muscle-related symptoms (weakness, tiredness, ache and pain, cramps, reduction in size, and restless legs), and four items assessed the impact of these symptom on ADLs (socialising, working, daily activities, and performing sport and exercise). Total scores were calculated based on the sum of all ten scales (total /100), and sub-scales for muscle-related symptoms (total /60) and ADLs (total /40). Higher scores indicated either more severe symptoms or greater impact on ADLs. General linear modelling was used to explore differences between groups.

### Results

Non-CKD adults had a 50% lower total mean score than CKD patients (31.7 $\pm$ 25.6 vs 15.9 $\pm$ 18.2,  $p$ <.001) as shown on Figure 1. Furthermore non-CKD adults showed a 46% lower severity score (21.3 $\pm$ 15.2 vs 11.5 $\pm$ 11.7,  $p$ <.001) and a 57% lower impact on ADLs score (10.5 $\pm$ 12.9 vs 4.5 $\pm$ 9.0,  $p$ <.001) than patients with CKD. Muscle ache and pain (4.4 $\pm$ 3.7 vs 2.7 $\pm$ 2.9,  $p$ <.001), muscle tiredness (4.3 $\pm$ 3.6 vs 2.5 $\pm$ 2.7,  $p$ <.001) and cramps (4.2 $\pm$ 3.5 vs 2.4 $\pm$ 2.8,  $p$ <.001) were the three most severe symptoms in both groups. Regression analysis indicated that gender was the only significant ( $B$ = 6.852,  $p$ =.013) predictor for total mean score in the CKD group.

### Conclusion

The results indicate that CKD patients experience the same muscle-related symptoms as non-CKD adults, these are: aches, tiredness and cramps. However, CKD patients, especially women, perceive these symptoms more severely. This suggest that CKD patients may need different coping strategies or interventions that aim to reduce these symptoms in order to improve quality of life.