

## **Seeing the Invisible:**

### **“Prevalence and Impact of Malnutrition in Non-Communicable Diseases: CKD as a Model”**

By Professor Kuan-Yu Hung (NTUH\_Hsinchu)

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Malnutrition is highly prevalent and easily missed or neglected in acute illness patients as well as those with chronic diseases. Chronic kidney disease (CKD) is one of the major non-communicable diseases in Taiwan. However, the prevalence of malnutrition and its impact in CKD healthcare remains undetermined.

In this talk, we will start by presenting a clinical case of CKD with malnutrition, the so-called malnutrition-inflammation syndrome. The next we will report our research work on malnutrition of CKD, which is based on a National Health Insurance cohort (the NHI database). By using the claimed NHI database (2009-2013), we identified and enrolled CKD patients of different severities (mild, moderate, and severe). A 1:4 propensity score-matched control group was also selected. We also compared the extent of healthcare resource utilization (outpatient department [OPD], emergency department [ED] visits, the frequencies and lengths of hospitalization), and the cumulative costs associated with different categories of medical care during the study period.

Here are the results. A total of 347,501 CKD patients were identified (37% mild, 32.2% moderate, and 30.8% severe), and 1087, 408, and 1433 propensity score matched CKD patients and their controls in mild, moderate, and severe groups, respectively, entered into analysis. CKD patients with malnutrition had significantly higher hospitalization ( $p < 0.001$  for all groups) and re-admission rates ( $p = 0.015$  and  $0.002$  for mild and severe group) than those without. Mild, moderate, and severe CKD patients with malnutrition had significantly higher frequencies of OPD, ED visit, and longer hospital length of stay, than those without ( $p < 0.001$  for all parameters and the three groups). Cumulative medical costs for OPD, ED visits, and hospitalizations

were significantly higher among mild, moderate, and severe CKD patients with malnutrition than those without ( $p < 0.001$ ). Furthermore, total medical costs were also higher among mild (62.9%), moderate (59.6%), and severe (43.6%) CKD patients with malnutrition than among those without ( $p < 0.001$ ).

In conclusion, from this nationally representative sampling, we discovered that CKD patients with malnutrition had significantly higher healthcare utilization and aggregative medical costs than those without, across the entire spectrum of CKD.

Before ending of our talk, we will return back to the discussion of the indicated case presentation, and will give experience sharing of how we provide adequate care of the patient. We would like to show you again the importance of nutrition surveillance in patients with chronic diseases.