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P315 -Exploring the relationship between habitual dietary zinc intake, appetite, and total energy consumed in CKD

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Introduction
Insufficient energy intake is an important factor in the development of malnutrition and subsequent clinical outcomes in CKD. One possible cause of reduced energy intake is loss of appetite, a symptom commonly reported amongst patients with CKD. The micronutrient zinc is known to contribute to appetite regulation, potentially via its effect on the hormone leptin. In those with zinc deficiency, leptin levels are raised, and hunger supressed. However, the literature supporting this pathway in CKD is poor. Whilst zinc deficiency has been explored in CKD, the majority of studies have investigated the prevalence in dialysis populations. This study explored the relationship between zinc intake, appetite, and total energy intake in non-dialysis dependent CKD.

Methods
Average daily zinc intake (mg) for 64 non-dialysis dependent CKD patients (41% females, mean age: 61.4 (SD 14.1) years, mean eGFR: 38.3 (SD 19.6) ml/min/1.73m2) was assessed using a Food Frequency Questionnaire (EPIC). Deficient zinc intake was based on the Public Health England's Government Dietary Recommendations (i.e. <7mg (females) or <9.5mg (males)). Frequency of appetite loss was measured using the Kidney Symptoms Questionnaire where frequency was ranked from 0-4 with 0 representing 'never' and 4 representing 'every day'. Total calorie intake and self-reported loss of appetite loss were compared between those with adequate dietary zinc intake and those without by univariate analyses of variance.

Results
36 (56%) patients had insufficient zinc intake with only 28 (44%) meeting the recommended daily requirement. The mean zinc intake in males was 9.2mg (SD 2.8) and in females was 6.6mg (SD 2.7). Patients with inadequate zinc intake had a mean energy intake of 1271.4 kcal/day (SD 409.9) whereas those with adequate zinc intake had a mean energy intake of 1984.2 kcal/day (SD 491.9); a significant difference of 712.8 kcal/day ($p<0.001$, following adjustment for potential confounding factors (age, gender and eGFR)). Loss of appetite was reported more frequently amongst patients with an inadequate zinc intake with a mean score of 0.97 compared to the adequate zinc intake mean of 0.61 ($p=0.278$).

Discussion
Patients with inadequate dietary zinc intake have lower total calorie intake, possibly mediated by the greater loss of appetite observed. This loss of appetite may be due to zinc-derived increases in leptin. Insufficient total calorie intake may increase the risk of malnutrition and associated clinical outcomes. Whilst our study is limited by its cross sectional nature, it reveals the large undertreated prevalence of zinc deficiency in CKD and its potential role in energy intake.