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LETTER

# Gout as a risk factor for osteoporosis: response to comments by Kostev

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Dear Editor,

Population-based cohort studies serve a purpose of exploring a potential causal association and estimating the magnitude of this association between the antecedent disease and an ensuing health outcome. Reproducibility of research findings is important in the scientific community. studies gather new data from an entirely different population; however, similar findings certainly shall give more weight to the credibility of the first observational study [1]. Dr. Kostev asked the same research question as ours [2] and conducted a similar study design using the German Disease Analyzer anonymized patient database, one of the largest real-world general practice databases containing longitudinal health records of approximately 10 million patients from Germany, the UK, France, and Austria [3].

The longitudinal UK database study included 99,800 participants with or without gout, having been 1 to 1 matched on age, gender, index year, and follow-up duration [4]. Although some in-depth methodology information is unavailable owing to the format of reporting as a letter, interestingly enough, the results are in line with our findings particularly on the magnitude (approximately 20% increased) of risk of osteoporosis development in individuals with gout (hazard ratio (HR) = 1.20, 95% confidence interval (CI) 1.06–1.35, $p = 0.004$ in Taiwanese study; HR = 1.21, 95% CI, 1.10–1.33, $p < 0.001$ in the UK study) when compared with the non-gout comparators. The UK population-based study also reveals similar findings as ours that the link between gout and subsequent osteoporosis is statistically significant in males (HR = 1.33, 95% CI, 1.10–1.61, $p = 0.003$ in Taiwanese study; HR = 1.51, 95% CI, 1.27–1.78, $p < 0.001$ in the UK study) but not in females (HR = 1.11, 95% CI, 0.95–1.30, $p = 0.18$, in Taiwanese study; HR = 1.10, 95% CI, 0.98–1.23, $p = 0.12$, in the UK study) [2, 4].

I did a quick meta-analysis of Kostev's and our findings to calculate a robust combined osteoporosis incidence rate ratio (IRR) using the fixed-effect model because the measure of heterogeneity between these two studies demonstrates minimal concern of heterogeneity with Cochran's $Q = 0.182$ (df = 1), $p = 0.67$, and $I$-square statistic shows 0%. The combined IRR is 1.23 (1.14–1.32).

Now that two large healthcare database studies from both the East and the West have produced similar results suggesting that patients with gout are susceptible to develop osteoporosis, further population-based studies with different study design to control for confounders are warranted.

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