Reviewer's report

Title: The Epidemiology of Infectious Gastroenteritis Related Reactive Arthritis in U.S. Military Personnel: A Case-Control Study

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Reviewer: Anders Ternhag

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This is a case-control study in US military personnel (majority men) that estimate the incidence rate of reactive arthritis following an episode of gastroenteritis. Cases and controls have been identified via military registers, so this is a retrospective record linkage study. The methodology is similar to a previous study by Chad K Porter published in Gastroenterology.

Exposure is defined as a medical visit for suspected infectious gastroenteritis within 6 months prior to case presentation. A case is someone diagnosed with ReA or unspecific arthralgia after exposure and who has sought medical care for this at least twice within a 12 month period.

The article is well written (maybe a bit too long), uses sound statistics, and have a straight forward objective.

My main concern about this study is that I question if the exposure really capture infectious gastroenteritis and if the outcome really measure reactive arthritis.

Culture confirmed gastroenteritis varies between 0.7-3.5% within 6 month prior to the joint problems. For the remaining patients (96.5%) are exposure defined as a doctor’s visit based on symptoms that may, or may not, be consistent with bacterial (or more likely viral) gastroenteritis.

I have no problems with the categories Reiter's disease and postdysenteric arthritis. In these cases have clinicians, based on their best judgement, decided that the joint problems are causally related to an IGE episode. But the far bigger category non-specific arthropathy are not related to the exposure, other than by record linkage in this particular study, and the fact that the OR are not that increased (or even decreased, see Q6), the incidence rate is exceptionally high compared to previous findings (Q2), makes this connection questionable in my opinion.

Major Compulsory Revisions

Q1: Why is the incidence increasing with age (figure 1)?

Q2: The annual age-specific incidence for 40+ with non-specific arthralgia is almost 350/100000 (figure 1). This is far more than 5-40/100000 which was previously expected to be the incidence rate for reactive arthritis.
Q3: After 1 year and up to 7 years after initial disease, 30-40% of those with ReA and almost 20% of patients with nonspecific arthropathy are still receiving care for their joint problems (figure 3). This is quite high compared to Finnish figures were 4-19% had problems more than 1 year (Leirisalo-Repo, M, Sieper, J. Reactive arthritis: epidemiology, clinical features, and treatment, in Ankylosing spondylitis and the spondyloarthropathies, M.H. Weisman, D. van der Heijde, and J.D. Reveille, Editors. 2006, Mosby Elsevier: Philadelphia. p. 53-64.). Comments?

Q4: My guess is that some of those with non-specific arthropathy may have athrosis, traumatic arthritis, gout or other diagnosis. Do we know if any of those diagnosed with non-specific arthropathy at their first visit to the doctor were re-diagnosed at a later visit?

Q5: Why has is the incidence rate for non-specific arthropathy risen more than 100% between 1999 and 2007 (figure 2)? This needs to be explained.

Q6: High risk deployment is a surrogate variable for IGE exposure and you should expect that the risk for both ReA and non-specific arthropathy would be increased for those persons compared to low risk deployment. But the OR is increased for ReA and decreased for non-specific arthropathy (table 4). How to explain this?

Q7: Does ‘documented infectious gastroenteritis’ mean culture confirmed (table 3)?

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests.