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Ulcerative colitis, Crohn's disease and other inflammatory bowel disease in a population with high exposure to per- and polyfluoroalkyl substances through drinking water

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Background: Per- and polyfluoroalkyl substances (PFAS) can act as surfactants and have been suggested to be capable of affecting gut mucosa integrity, a possible pathogenesis of ulcerative colitis (UC), Crohn's Disease (CD) and other inflammatory bowel disease (IBD). So far, only perfluorooctanoic acid (PFOA) has been shown a potential positive association with UC.

Objectives: To investigate the associations of PFAS and diagnosed UC, CD and other IBD in Ronneby cohort, a population with high PFAS exposure through drinking water, using registry data.

Methods: All people that ever resided in Ronneby municipality at least one year between 1980 and 2013 were included. Crude exposure (never/ever) and time-varied exposure (never/early/mid/late) were assessed based on yearly residence address and waterworks supply data. Early period (1985-1994) were assumed the lowest exposure, and late period (2005-2013) were assumed highest exposure. Diagnosed IBD cases were retrieved from Swedish National Patient register and cause-of-death register. Cox proportional hazards model was used to estimate the hazard ratios (HRs) for diagnosed IBD, in men and women separately.

Results: No higher HRs for any kind of IBD were found for cohort subjects ever exposed compared to never exposed, in men or women. No trend of increasing HRs were found across the time-varied exposure, either. Only a slightly higher HR for CD was found for women with early period exposure compared to never exposure (HR =1.76, p=0.073), and a slightly higher HR for other IBD for men with early exposure (HR=1.51, p=0.083). These higher HRs for early period exposure were not followed by higher HRs for mid (1995-2004) and late period exposure.

Conclusions: The lack of an overall effect together with the lack of a dose response across time-varied exposure (representing increasing exposure levels) in the present study did not support that PFAS exposure is a risk factor for IBD.