Abdominal symptoms among sewage workers

L. Friis,* L. Agréus and C. Edling*

*Department of Occupational and Environmental Medicine and
^Department of Family Medicine, University Hospital, Uppsala, Sweden

The objective of this cross-sectional study was to investigate the prevalence of abdominal symptoms and the abdominal medical history among sewage workers. 142 male sewage workers and 137 male referents in 11 Swedish municipalities were addressed with a questionnaire about abdominal symptoms, medical history, occupational history and life style factors. The sewage workers suffered less from nausea [adjusted odds ratio (adjOR) = 0.18, 95% confidence interval (CI) = 0.04–0.84] than the referents. There was no significant difference in the three months prevalence of diarrhoea (adjOR = 1.7, 95% CI = 0.79–3.4), dyspepsia (adjOR = 0.85, 95% CI = 0.49–1.5) or irritable bowel syndrome (adjOR = 1.4, 95% CI = 0.53–3.5). The sewage workers were affected more often by peptic ulcers during their present jobs than the referents, although the increased risk was not significant (adjOR = 1.4, 95% CI = 0.31–6.1). The odds ratios were adjusted for age, use of tobacco products and alcohol consumption. The conclusion of this study was that sewage workers are less affected by nausea than comparable referents.

Key words: Abdominal symptoms; dyspepsia; epidemiology; IBS; occupational; peptic ulcers; sewage workers.

INTRODUCTION

Although essentially healthy, like active workers in general, there are some reports about negative health effects among sewage workers. Fever reactions, various respiratory symptoms and reduced lung function have been found among sewage workers.1,2 Some infections have been described among sewage workers.3,4 Skin disorders, transitory diarrhoea and other gastrointestinal symptoms of short duration have also been reported in excess among sewage workers.5,6 Protracted gastrointestinal disturbances among sewage workers are not reported. One possible serious long term effect on the gastrointestinal tract by sewage exposure is the increased risk for cancer of the stomach described in a few studies.7-9

The aim of this study was to test for an association between gastrointestinal symptoms or a history of gastrointestinal disease and sewage work.

SUBJECTS AND METHODS

In a cross sectional study, all 156 workers employed at the municipal sewage plants in eleven municipalities in mid-Sweden were identified by their employers or occupational health care units. Referents not working in the sewage treatment process were selected among labourers at the same authority at each municipality. The goal was to select one referent of the same gender within ± 5 years of age for each exposed worker. One hundred and forty-seven referents meeting the selection criteria were found. Five sewage workers and nine among the invited referents declined participation. Nine among the participating sewage workers and one among the referents were women. The majority of the female sewage workers had low exposures at plant laboratories. All 10 female workers were excluded from further analyses, as the natural differences in abdominal symptoms between the genders might introduce troublesome confounding. One hundred and forty-two male sewage workers (91%) and 137 male referents (93%) remained for the analysis. The mean age for the sewage workers was 47.9 years [standard deviation (SD) = 9.94], and the mean age for the referents was 46.6 years (SD = 10.2). The sewage workers and the referents had been in their present jobs an average of 15.7 years (SD = 8.5) and 15.9 years (SD = 9.6).
respectively.
A validated questionnaire about abdominal symptoms was filled in by the exposed workers and the referents. This was not done simultaneously at all places, but spread out over all seasons. The questionnaire inquired about the three-month prevalence of 24 different abdominal symptoms, and it has, by means of symptom clustering, been shown to be a useful tool in diagnosing those with dyspepsia and the irritable bowel syndrome (IBS). Dyspepsia presents with symptoms from the upper alimentary tract, e.g., abdominal pain, heartburn, reflux, distension and early satiety. IBS, on the other hand, presents with symptoms from the bowels, e.g., abdominal pain, diarrhoea and constipation. Questions regarding lifestyle factors and medical and occupational history were also included in the form.

Adjusted odds ratios (adjOR) with 95% confidence intervals (CI) were calculated from logistic regression models for symptoms or diagnoses, with employment as sewage worker as a proxy for exposure, and the confounder variables age, tobacco smoking, use of wet snuff and regular weekly alcohol consumption. All variables, except age, were dichotomous.

RESULTS

There was a significantly decreased risk among the sewage workers for nausea and a nonsignificant increased risk for diarrhoea (Table 1). No statistically significant differences in dyspepsia or IBS between the sewage workers and referents were observed. Nor was there any significant difference in the cumulative incidence of peptic ulcers during the present employment, although there was a slight numerical elevation of the risk estimate for the sewage workers. Three sewage workers and one referent had also had peptic ulcers before their present jobs, but none had occupational sewage exposure prior to those diagnoses.

DISCUSSION

The decreased risk for nausea among the sewage workers is probably not an exposure-related health effect. One might rather assume that people who stay in jobs at sewage plants are less prone to react with nausea. The previously described occurrence of diarrhoea among sewage workers was present also in this study. However, the question in this study was about the 3 months’ prevalence, and was put at various times over the year. Therefore one may expect an underestimation of this transient phenomenon, mainly occurring after the long seasonal holidays. Risk estimates may also be reduced by using job title as a proxy for some unspecified exposure, since unexposed workers may then wrongly be classified as exposed.

The numerically elevated risk for peptic ulcers among sewage workers deserves some attention. Recall bias may increase risk estimates in studies of explicitly stated diseases when comparing exposed groups with unexposed referents. However, it is not likely that there is recall bias for such a diagnosis as peptic ulcer, which usually gives pronounced symptoms and requires specific diagnostic procedures and treatment. Furthermore, the ulcer diagnoses reported in this study were in all cases but one confirmed by X-ray or endoscopy. Infection with Helicobacter pylori is related to increased risk for peptic ulcers. The same organism is also one risk factor for cancer of the stomach and an increased risk for stomach cancer among sewage workers has been reported from a few studies. These observations are suggestive of Helicobacter pylori as a risk factor for these diseases among sewage workers. However, in a recent study we found no increased risk for infection with Helicobacter pylori among these same Swedish sewage workers. Although this indicates that the elevated risk for peptic ulcers probably is a chance finding in a study with low power, additional studies could still be warranted as there are reports about isolation of Helicobacter pylori from faeces and a risk of contamination by water.

CONCLUSIONS

Apart from disposition away from nausea there were no other significant differences in abdominal symptoms between the sewage workers and the referents. The tendency for less nausea among the sewage-exposed workers is not interpreted as an effect of the

| Table 1. Frequencies, adjusted odds ratios (adjOR) and 95% confidence intervals (95% CI) for the three months prevalence of dyspepsia, irritable bowel syndrome (IBS), three abdominal symptoms, and history of peptic ulcer during the present employment period among Swedish sewage workers, compared to unexposed referents. The odds ratios are based on logistic models where the confounders age, tobacco smoking, use of wet snuff and regular weekly alcohol consumption were included. |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|
|                                 | Sewage workers (n = 142) | Referents (n = 137) | adjOR | 95% CI          |
| Dyspepsia                       | 33               | 36               | 0.85  | (0.49–1.5)      |
| IBS                             | 11               | 8                | 1.4   | (0.55–3.7)      |
| Nausea                          | 2                | 10               | 0.20  | (0.043–0.96)    |
| Diarrhoea                       | 21               | 13               | 1.7   | (0.82–3.7)      |
| Pain in the stomach             | 29               | 25               | 1.2   | (0.67–2.2)      |
| Peptic ulcer                    | 5                | 3                | 1.4   | (0.31–6.1)      |

Downloaded from https://academic.oup.com/occmed/article-abstract/48/4/251/1423572 by guest on 15 February 2019
exposure; the causal connection may be in the opposite direction.

REFERENCES