

INCIDENCE OF HOSPITALIZED OSTEOPOROTIC FRACTURES AND PERSISTENT ORGANOCHLORINE COMPOUNDS

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Introduction

Environmental factors might be of importance for the dramatically increasing incidence of osteoporotic fractures in the western societies since the Second World War¹. Persistent organochlorine compounds (POC) have, in animal studies, impaired normal bone metabolism and resulted in increased bone fragility²⁻⁴. The aim of the present study was to assess whether a high dietary intake of POC through fatty fish from the Baltic Sea (at the Swedish east coast) may result in an increased incidence of osteoporotic fractures.

Methods and Materials

Due to the relatively high consumption of locally caught fish, fishermen and their wives from the Swedish east (exposed) and west (unexposed) coasts constituted the study base^{5,6}. The west coast cohorts were selected due to socioeconomic similarities between the cohorts, and the fact that fatty fish from the Swedish west coast had been considerable less contaminated⁷. Information on vital status and hospitalization of persons with fractures from 1987 to 1996 was retrieved for 17 823 subjects through register linkage (table 1). The fractures were classified according to the ninth revision of the International Classification of Diseases. The impact of cohort affiliation (east versus west coast) was assessed by Poisson regression models, with age and calendar year taken into account.

Table 1. Vital status as of 31 December 1996 for cohorts of Swedish fishermen and their wives from the west and east coasts, respectively.

Vital status	Fishermen		Fishermen's wives	
	West coast	East coast	West coast	East coast
Living	5572	2335	5166	1850
Dead	1333	412	906	198
Lost to follow-up	29	11	9	2
Total	6934	2758	6081	2050

Results and Discussion

In total, there were 586 incident fractures in women, of which 418 were osteoporotic (table 2). The corresponding values for men were 524 and 253. The total fracture incidence did not differ between the east and west coast cohorts, irrespectively of gender. The same result was seen for all osteoporotic fractures and for hip fractures. In contrast, there was a significantly increased incidence of vertebral fractures among the east coast women as compared with the west coast women (age-adjusted Incidence Rate Ratio [IRR] 2.29, 95% confidence interval [CI] 1.34-4.28). The effect was in the same direction among the men, but the difference was not significant (IRR 1.45, 95% CI 0.74-2.84).

The results give some indirect support for the notion that a high dietary intake of POC through fatty fish from the Baltic Sea might be a risk factor for vertebral fractures. However, it cannot be excluded that confounding from for instance differences in smoking habits might explain a part of the observed effects. To clarify this, detailed information on exposure and potential confounders has to be ascertained.

Table 2. Age-adjusted Incidence Rate Ratio (IRR) for skeletal fractures among fishermen and their wives from the Swedish east coast and their wives from the Swedish west coast.

Fractures Coast	Fishermen			Fishermen's wives		
	N	IRR	95% CI	N	IRR	95% CI
Vertebral (ICD 805)						
West	26	1.00		27	1.00	
East	13	1.45	0.74-2.84	16	2.29	1.23-4.28
Hip (ICD 820)						
West	136	1.00		229	1.00	
East	34	0.86	0.59-1.26	53	0.99	0.74-1.34
Osteoporotic (ICD 805, 808, 812, 813, 820)						
West	196	1.00		329	1.00	
East	57	0.94	0.70-1.26	89	1.12	0.89-1.42
Total fractures (ICD 800-829)						
West	388	1.00		461	1.00	
East	136	0.96	0.79-1.17	125	1.04	0.85-1.27

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