Disability from inflammatory bowel disease among employees in West Germany

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SUMMARY The statistics of the German social security system were used to analyse the epidemiology of inflammatory bowel disease (IBD) in Germany and to assess its impact on disability. Patients granted disability pension for IBD were compared with a control group of patients disabled from other causes. Crohn's disease and ulcerative colitis led to disability in significantly younger patients than other diseases. Disability from Crohn's disease was 2.0-fold more common in women than men (95% confidence interval: 1.8-2.3), while disability from ulcerative colitis was similar in both sexes. White collar employees were affected by both diseases more frequently than blue collar employees, the ratio being 1.3 (1.2-1.5) in Crohn's disease and 1.6 (1.4-1.8) in ulcerative colitis. Although IBD is relatively rare, it has severe socioeconomic implications, because compared with other diseases, predominantly young age groups become disabled.

The epidemiology of inflammatory bowel disease (IBD) – that is, Crohn's disease and ulcerative colitis, has been described in multiple studies from the United States,^{1,4} the United Kingdom,^{5,8} Israel,⁹⁻¹² and the Scandinavian countries.¹³⁻¹⁷ Although inflammatory bowel disease is quite frequent in West Germany, until now only one published report has dealt with the epidemiology of IBD in Germany.¹⁸ In the present study, the statistics of the German social security system were used to analyse the epidemiology of IBD in Germany. Patients granted disability for IBD were compared with patients granted disability for other medical causes. Comparing these two populations, we sought to describe the characteristics of IBD patients with regard to their age, sex, and occupational status.

Methods

SUBJECTS

According to German law on social security every employee holds mandatory a disability insurance. The social security system covers 20 million

employees – that is, 93% of the German workforce. Civil servants and entrepreneurs or others self-employed with incomes above certain thresholds are covered by a separate governmental insurance system and private insurance companies, respectively. A disability pension is most often granted after a long or complicated case history in which illness has been examined by physicians several times. As disability pension is costly, the report recommending disability payments is scrutinised by the granting insurance company. The insurance company may ask additional consulting physicians to review the case and confirm the diagnosis.¹⁹ The age and sex specific numbers of subjects granted a disability pension are accumulated by the Verband Deutscher Rentenversicherungsträger and published annually.²⁰ In addition to age and sex, the numbers are broken down by occupational status, – that is, blue *versus* white collar employees. The statistics are coded according to the International Classification of Diseases (ICD). In the 9th revision of the ICD used by the Verband Deutscher Rentenversicherungsträger since 1982, regional enteritis (Crohn's disease) and idiopathic proctocolitis (ulcerative colitis) have been assigned the codes 555 and 556, respectively. In the statistics before 1982, Crohn's disease and ulcerative colitis were listed together under the summary code 563 (chronic enteritis and ulcerative colitis) of the 8th

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Table 1 Number of disabilities from Crohn's disease, ulcerative colitis, and other causes by age, sex and occupational status: 1982-1986

Sex	Age	Blue collar employees			White collar employees		
		CD	UC	Other	CD	UC	Other
Men	-40	157	54	32 907	47	13	7059
	-45	48	30	33 407	13	14	6352
	-50	55	41	63 006	18	7	10 888
	-55	36	55	110 342	17	18	23 015
	-60	63	65	202 162	38	37	66 272
	-65	19	46	121 566	9	22	45 578
	65+	1	0	5725	0	0	1836
Women	-40	171	30	11 874	234	62	13 903
	-45	45	14	11 164	44	15	10 383
	-50	37	19	22 740	41	21	15 647
	-55	41	24	47 723	23	22	28 730
	-60	54	37	130 873	58	54	103 138
	-65	28	35	153 519	24	30	78 539
	65+	2	0	26 186	0	1	5888

CD=Crohn's disease, UC=ulcerative colitis, Other=other medical diagnoses.

revision of the ICD. The present study was based on the statistics from 1982 to 1986.

Inflammatory bowel disease patients were compared with all other disability patients serving as controls. The risk of contracting IBD associated with sex and occupational status was assessed by the odds ratio (OR). In calculating the odds ratio for female *versus* male sex, the confounding effect of age and occupational status was controlled by the procedure of Mantel and Haenszel. Similarly, the confounding effect of age and sex was controlled in calculating the odds ratio for white *versus* blue collar occupation. The confidence limits of the odds ratio were calculated by the method of Miettinen. The overall significance for the set of 2x2 tables was tested by the Mantel Haenszel modification of the χ^2 test.²¹ The age distributions of IBD patients and controls were compared by simple χ^2 test.²²

Results

On average, 279 000 employees per year were granted a disability pension for medical causes. From 1982 to 1986, 1321 employees were granted a disability pension because of Crohn's disease, and 766 employees were granted a disability pension because of ulcerative colitis. Table 1 shows disability from Crohn's disease, ulcerative colitis, and other causes by age, sex, and occupational status. The age distribution of both Crohn's disease and ulcerative colitis was significantly different from that of other diseases: for Crohn's disease $\chi^2=5328$, $df=6$, $p<0.0005$; for ulcerative colitis $\chi^2=545$, $df=6$,

Figure Age distribution of subjects granted disability pensions for Crohn's disease, ulcerative colitis, and other causes from 1982 to 1986.

$p<0.0005$ (Figure). In Crohn's disease, the largest fraction of disability pensions was granted to patients younger than 40 years with a small secondary peak occurring at the age 60 to 64 years. In ulcerative colitis, a bimodal age distribution was also found. Compared with Crohn's disease, the second peak was larger and affected more age groups. Similar age distributions were found in men and women (Table 1).

Disability from Crohn's disease was 2.0-fold more common in women than men (95% confidence interval: 1.8-2.3, $\chi^2=154$, $p<0.001$), while disability from ulcerative colitis was similar in both sexes: OR=1.1 (0.9-1.2, $\chi^2=0.5$, $p>0.05$). Disability from both diseases occurred more frequently in white than blue collar employees. In Crohn's disease, the odds ratio for white *versus* blue collar occupation was OR=1.3 (1.2-1.5, $\chi^2=25$, $p<0.001$). In ulcerative colitis it was OR=1.6 (1.4-1.8, $\chi^2=36$, $p<0.001$).

Discussion

In the present study, the data base of the social security system served to assess morbidity from Crohn's disease and ulcerative colitis in West Germany. Similar to the United States and most northern European countries, the German data show

that women contract Crohn's disease more frequently than men.¹⁻¹⁸ Female predominance was less marked in ulcerative colitis than in Crohn's disease. The reason why women become affected more frequently is unknown. Although the difference between male and female occurrence is not striking, the consistency of this pattern in most European countries and the United States is remarkable.

Crohn's disease and ulcerative colitis show similar age distributions. In comparison with other diseases, younger age groups become disabled. Although IBD is relatively rare it has severe socioeconomic implications. Some studies found a bimodal age distribution of IBD with a secondary smaller peak of incidence occurring at ages 55 to 65 years.^{23,24} In the present study, the age distributions of both diseases also suggest bimodality with the secondary peak being more pronounced in ulcerative colitis than in Crohn's disease.

Both Crohn's disease and ulcerative colitis are associated with significantly higher disability among white than blue collar employees. Other studies have also revealed a higher socioeconomic and educational status of patients with IBD as compared with the general population.²³⁻²⁷ A study from Copenhagen, Denmark, showed a higher percentage of subjects with high educational and economic level among patients with ulcerative colitis than in the general population.²⁵ A study from England suggested subjects in the managerial and skilled manual groups to be more prone to develop Crohn's disease.²⁶ In the United States army, Acheson and Neffzger found that more cases with ulcerative colitis than controls had come from professional, managerial, or proprietary levels of employment before entering the army.²⁷ It appears that white collar employees, high social classes, or professionals are more exposed to some environmental factor which induces or favours the development of IBD.

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References

- Garland CF, Lilienfeld AM, Mendeloff AI, Markowitz JA, Terrell KB, Garland FC. Incidence rates of ulcerative colitis and Crohn's disease in fifteen areas of the United States. *Gastroenterology* 1981; **81**: 1115-24.
- Calkins BM, Lilienfeld AM, Garland CF, Mendeloff AI. Trends in incidence rates of ulcerative colitis and Crohn's disease. *Dig Dis Sci* 1984; **29**: 913-20.
- Stonington CM, Phillips SF, Melton III LJ, Zinsmeister AR. Chronic ulcerative colitis: incidence and prevalence in a community. *Gut* 1987; **28**: 402-9.
- Gollop JH, Phillips SF, Melton III LJ, Zinsmeister AR. Epidemiologic aspects of Crohn's disease: a population based study in Olmsted County, Minnesota, 1943-1982. *Gut* 1988; **29**: 49-56.
- Devlin HB, Datta D, Dellipiani AW. The incidence and prevalence of inflammatory bowel disease in North Tees health district. *World J Surg* 1980; **4**: 183-93.
- Sinclair TS, Brunt PW, Mowat NAG. Nonspecific proctocolitis in northeastern Scotland: a community study. *Gastroenterology* 1983; **85**: 1-11.
- Morris T, Rhodes J. Incidence of ulcerative colitis in the Cardiff region 1968-1977. *Gut* 1984; **25**: 846-8.
- Lee FI, Costello FT. Crohn's disease in Blackpool - incidence and prevalence 1968-80. *Gut* 1985; **26**: 274-8.
- Gilat T, Ribak J, Benaroya Y, Zemishlany Z, Weissman I. Ulcerative colitis in the Jewish population of Tel-Aviv-Yafo. I. Epidemiology. *Gastroenterology* 1974; **66**: 335-42.
- Rozen P, Zonis J, Yekutieli P, Gilat T. Crohn's disease in the Jewish population of Tel-Aviv-Yafo. *Gastroenterology* 1979; **76**: 25-30.
- Jacobsohn WZ, Levine Y. Incidence and prevalence of ulcerative colitis in the Jewish population of Jerusalem. *Isrl J Med Sci* 1986; **22**: 559-63.
- Odes HS, Fraser D, Krawiec J. Ulcerative colitis in the Jewish population of southern Israel 1961-1985: epidemiological and clinical study. *Gut* 1987; **28**: 1630-6.
- Myren J, Gjone E, Hertzberg JN, Rygvold O, Semb LS, Frøtheim B. Epidemiology of ulcerative colitis and regional enterocolitis (Crohn's disease) in Norway. *Scand J Gastroenterol* 1971; **6**: 511-4.
- Brahme F, Lindström C, Wenckert A. Crohn's disease in a defined population. An epidemiological study of incidence, prevalence, mortality, and secular trends in the city of Malmö, Sweden. *Gastroenterology* 1975; **69**: 342-51.
- Binder V, Both H, Hansen PK, Hendriksen C, Kreiner S, Torp-Pedersen K. Incidence and prevalence of Crohn's disease in the county of Copenhagen, 1962 to 1978. *Gastroenterology* 1982; **83**: 563-8.
- Nordenvall B, Broström O, Berglund M, et al. Incidence of ulcerative colitis in Stockholm county 1955-1979. *Scand J Gastroenterol* 1985; **20**: 783-90.
- Nyhlin H, Danielsson A. Incidence of Crohn's disease in a defined population in northern Sweden, 1974-1981. *Scand J Gastroenterol* 1986; **21**: 1185-92.
- Brandes JW, Lorenz-Meyer H. Epidemiologische Aspekte zur Enterocolitis regionalis Crohn und Colitis ulcerosa in Marburg/Lahn (FRG) zwischen 1962 und 1975. *Z Gastroenterol* 1983; **21**: 69-78.
- Bundesarbeitsgemeinschaft für Rehabilitation. *Die Rehabilitation Behinderter. Wegweiser für Ärzte*. Cologne: Deutscher Ärzte-Verlag, 1984.
- Verband Deutscher Rentenversicherungsträger. *VDR Statistik Rentenzugang*, vol 60-75. Frankfurt, 1983-1987.
- Kahn HA. *An introduction to epidemiologic methods*. New York: Oxford University Press, 1983: 81-94.
- Zar JH. *Biostatistical analysis*. Englewood Cliffs NJ: Prentice-Hall, 1984: 61-78.

- 23 Mendeloff AI, Calkins BM. Epidemiology of idiopathic inflammatory bowel disease. In: Kirshner JB, Shorter RG, eds. *Inflammatory bowel disease*. Philadelphia: Lea & Febiger, 1988: 3–34.
- 24 Rogers BHG, Clark LM, Kirshner JB. The epidemiologic and demographic characteristics of inflammatory bowel disease: an analysis of a computerized file of 1400 patients. *J Chronic Dis* 1971; **24**: 743–53.
- 25 Bonnevie O. A socio-economic study of patients with ulcerative colitis. *Scand J Gastroenterol* 1967; **2**: 129–36.
- 26 Keighley A, Miller DS, Hughes AO, Langman MJS. The demographic and social characteristics of patients with Crohn's disease in the Nottingham area. *Scand J Gastroenterol* 1976; **11**: 293–6.
- 27 Acheson ED, Nefzger MD. Ulcerative colitis in the US army in 1944. *Gastroenterology* 1963; **44**: 7–19.