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Importance of accurate employment histories of patients admitted to units of internal medicine

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GENNART JP, HOET P, LISON D, LAUWERYS R, COCHE E, LAMBERT M. Importance of accurate employment histories of patients admitted to units of internal medicine. *Scand J Work Environ Health* 1991;17:386-91. A study was undertaken to assess the importance of systematically recording occupational histories of patients admitted to an internal medicine unit of a university hospital. Detailed information on current and past employment was obtained with questionnaires and in personal interviews from 200 inpatients over a 12-month period. Twenty-one patients (10.5 %) were considered to have a "primary illness" (condition causing hospital admission) probably (4.5 %) or possibly (6 %) related to their current or previous occupation. From the 786 primary and secondary illnesses and medical antecedents diagnosed for the 200 patients examined, 70 illnesses of 55 patients were considered probably or possibly related to current or previous occupation. This pilot study emphasizes the need for accurate occupational records for patients in an internal medicine ward. This task is best performed by an appropriately trained occupational physician.

Key terms: medical history, occupational disease.

Despite all the sophisticated techniques available to detect functional and morphological organ disturbances, accurate records of a patient's medical history remain of paramount importance. An accurate history can yield essential information with which to formulate possible diagnoses, suggest complementary investigations, adapt the treatment, or assess the prognosis of the illness. The medical history is also the most valuable tool in identifying those environmental factors which cause or aggravate certain pathological conditions. However, the general practitioner and the internist usually limit their questioning to dietary, smoking, and drinking habits and drug consumption. The occupational history is not frequently assessed in detail because it is difficult to perform correctly, is time-consuming, and is considered rarely productive. An evaluation of medical charts by Sokas et al (1) revealed that only half of the charts recorded employment status. It is not surprising that over 80 % of the occupational diseases identified in two occupational medicine clinics in the United States were not correctly diagnosed by the primary physicians (2).

But even when a job history is provided by the patient, it is often difficult to ascertain occupational risks for the following reasons: (i) occupational environments are complex and rapidly changing and physi-

cians who are unfamiliar with modern industrial activities cannot always identify the occupational risks in a patient's job; (ii) patients cannot always provide the names of the chemical compounds present at their workplace; (iii) industrial confidentiality may prevent the disclosure of names or formulas of industrial chemical preparations; (iv) the long latency period between the onset of exposure and the symptoms of some diseases (eg, cancer) leads to forgetfulness about past exposure; and (v) the search for an occupational factor is often not considered if another etiologic agent has been identified (eg, tobacco consumption for a patient with lung cancer).

The present pilot study was undertaken to assess the importance of systematically recording occupational histories of patients admitted to an internal medicine unit of a Belgian university hospital. The objective was not to determine the pattern of occupational diseases which may be diagnosed in Belgian hospitals, but to assess whether a detailed occupational record is justified in the medical work-up of hospitalized patients. Although the design of such a study cannot totally exclude the possible influence of observer biases, effort was made to reduce it as much as possible by having the assessment performed independently by four occupational physicians. The results of this preliminary study provide a clear indication of the importance of occupational risk factors in the pathogenesis of diseases diagnosed in general and internal medicine.

Subjects and methods

Population and hospital characteristics

The study population was a random sample of all the patients who were admitted to a general internal medi-

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cine unit in a 12-month period and who fulfilled the following criteria: (i) held paid employment for at least one year in a lifetime and (ii) able to answer a questionnaire and be interviewed for 1 h. Fifty percent of the patients lived in the city of Brussels (1 million inhabitants). The remaining 50 % resided in the French-speaking area of Belgium (3.5 million inhabitants). The hospital had no selection criteria at admission. It acted as a general hospital for the urban population of Brussels and as a referral hospital for the French-speaking area of the country. No Belgian hospital has an inpatient occupational medicine unit.

A sample of 224 patients was initially selected, representing 10 % of the patients hospitalized in the internal medicine unit during the study period. Nineteen people were considered uncooperative and five patients who had filled out the forms were discharged before the interview could take place. Two hundred patients (157 men and 43 women) were included in the final study. Their ages ranged from 20 to 82 (mean 51.8, SD 14.6) years. One hundred and thirty-three were still occupationally active; 59 were retired, and eight were unemployed at the time of the study. The ratio of blue-collar to white-collar workers was 85:115. The characteristics of the study population (age and cause and duration of hospitalization) were not markedly different from those of the total population admitted to the internal medicine unit during the same period. The proportion of women was lower in the study population (22 versus 45 %) since 56 % of the hospitalized women had never held paid employment and were not selected for the study.

Occupational history

At admission, each patient in the study population was given a detailed questionnaire adapted from that of Rosenstock et al (3). The form was designed to collect information on (i) all occupational activities, (ii) exposure to chemical, physical, or infectious agents at work and otherwise, (iii) use of personal protective equipment, (iv) personal hygiene practices, (v) second job, and (vi) hobbies. Two or three days later, personal interviews allowed the patient's answers to be explored in depth. The interviews were conducted by three occupational physicians. In several cases, additional information was requested from the employer or the plant physician. After the patients' discharge from the hospital, their medical files were examined and the following data were extracted: (i) diagnosis of the illness which motivated the admission (primary illness), (ii) other diseases identified during the medical work-up (secondary illnesses), and (iii) medical antecedents (ie, diseases which occurred in the past).

Congenital and perinatal diseases, pregnancy, and accidents were not considered in the study. Occupations and diseases were coded according to the classifications of the International Labour Office (4) and the World Health Organization (5). The assessment of a relationship between diseases and occupations was

based on data from the literature (ie, reports of an increased relative risk of specific illnesses in some occupations or following exposure to some chemicals), but it also took into account the intensity and the duration of exposure, the latency period from onset of exposure to evidence of disease, and the possible role of other exogenous factors (smoking, alcohol, hobbies, etc).

Each current or past illness was assessed as probably related, possibly related, or not related to occupational factors. The criteria for the first category (probably related) were (i) the existence of a well-established association between job and disease and (ii) knowledge of an exposure of sufficient intensity to cause the disease (eg, pneumoconiosis in a coal worker). In the second category (possibly related), the criteria were (i) the existence of epidemiologic studies or case reports suggesting a possible association (eg, liver cirrhosis following long-term exposure to solvent mixtures) and (ii) the existence of a definite association between exposure and disease, the exposure intensity however being considered low (eg, asbestosis in a worker sawing asbestos-cement products intermittently). The final assessment was performed independently by four occupational physicians. In divergent cases the decision was made jointly by the team.

Results

Twenty-one patients (10.5 %) were considered to have a primary illness which was probably related ($N=9$) or possibly related ($N=12$) to their current or previous occupations (table 1).

From the 786 primary and secondary illnesses and medical antecedents diagnosed for the 200 patients examined, 70 illnesses were considered probably related or possibly related to current or previous occupations. Therefore 55 of the 200 inpatients had illnesses resulting from employment. Table 2 presents the nosological distribution of these work-related diseases. Respiratory tract impairment represented the greatest proportion (25.7 %) of the 70 diseases considered probably related or possibly related to occupation. Musculoskeletal diseases were the second most frequent work-related impairments.

Seventy-three infectious diseases were identified (7 still active and 66 recorded in the medical history). Fifteen percent of these diseases were related to the patient's occupational activities. There were eight cases of cardiovascular disease caused or aggravated by occupational activities (one diagnosis of right heart failure secondary to silicosis, four cases of angina pectoris occurring in patients exposed to carbon monoxide, and three cases of lower-limb varices in patients whose jobs required long periods of standing. Six (12 %) of the 50 neoplastic diseases were considered possibly related to previous occupational activities.

Table 3 presents the distribution of patients with work-related illnesses (primary + secondary illnesses

Table 1. Patients whose primary illness was probably or possibly related to their occupational activities. (ICD = International Classification of Diseases, ILO = International Labour Office)

Case number	Disease	ICD code	Occupational hazard	Occupation	ILO code	References
<i>Probable link between occupation and primary illness</i>						
22	Coal workers's pneumoconiosis	5000	Silica and coal dust	Coal mine engineer	027	6
35	Asthmatic bronchitis	4939	Vegetable and animal dust	Furniture upholsterer (handling of wool, feather, straw)	796	6
41	Chronic obstructive pulmonary disease	4912	Silica and coal dust, nitrous oxide	Miner	711	7, 8
64	Brucellosis	0239	Brucella	Farmer	611	9
66	Arthritis (staphylococcus)	0411	Staphylococcus (skin infection)	Farmer	611	10, 11
100	Cor pulmonale	4168	Silica and coal dust	Coal mine technician	038	6
114	Malaria	0841	Plasmodium vivax	TV viewman (travel to Ethiopia)	163	12
158	Acute upper respiratory tract inflammation	4658	Formaldehyde	Operator (pharmaceutical industry) regularly exposed to formaldehyde	749	13
171	Lumbago	7242	Lifting	Warehouse worker	971	14—16
<i>Possible link between occupation and primary illness</i>						
3	Coronary heart disease	4130	Carbon monoxide	Motor vehicle mechanic	843	17—22
11	Liver cirrhosis	5715	Solvents	Printer	921	23, 24
27	Malignant histiocytosis	2023	Pesticides (?), viruses (?)	Farmer	611	25—32
34	Emphysema, broncho-pneumonia	5064 4850	Solvents (aerosol)	Production and demonstration of aerosols	211	33—35
105	Chronic obstructive pulmonary disease	4912	Cold, dusts	Bricklayer	951	36, 37
120	Psychophysiological disorder	3060	Solvents	Electrician (degreasing tank in the workplace)	855	38, 39
123	Bladder cancer	1889	Aromatic amines	Offset printer	922	40—42
140	Lumbar discopathy	7221	Lifting + vibrations	Farmer	611	43
169	Pulmonary fibrosis	4959	Asbestos	Cement kiln worker	742	6
176	Hodgkin's disease	2015	Pesticides (?), viruses (?)	Farmer	611	25, 27, 41, 44
193	Malignant neoplasm of the pleura	1639	Asbestos	Roofer (sawing asbestos-cement products)	953	6
198	Hyperleucocytosis isolated	2888	Benzene	Printing house mechanic	839	45—47

and medical antecedents) in the various occupational groups. It is interesting to note that all of the agricultural workers (N = 6) had work-related illnesses.

Table 4 lists the physical, chemical, and biological agents which have been estimated to be probably or possibly responsible for the diagnosed occupational diseases.

Discussion

Before it can be concluded that a patient's illness has been caused or aggravated or accelerated by his or her current or past occupational activities, it is necessary that previous studies have reported the existence of an association between the illness and occupational risk factors and also that the circumstances of the patient's occupational exposure (intensity, duration) are compatible with a cause-effect relationship. In practice, for

the various reasons already discussed (see the Introduction), the assessment of the fulfillment of both criteria is difficult. Furthermore, this assessment may also be influenced by the medical context in which it is performed (general practice, work compensation) and the relationship between the patient and the physician (family physician, insurance company physician, etc). These possible biases did not influence the results of this study, which was performed independently of any socioeconomic constraint. Despite these shortcomings, several tentative conclusions can be drawn from the study, whose validity should be assessed by a broader epidemiologic study involving several internal medicine clinics located in various industrial, urban, and rural areas.

One must, however, recognize that, in this study, most of the associations suggested between occupational exposures and diseases involved some subjec-

Table 2. Primary and secondary illnesses and medical antecedents probably or possibly related to occupation.

Illness	Total number of illnesses	Probably responsible		Possibly responsible		Total	
		N	%	N	%	N	%
Infectious and parasitic diseases	73	6	8.2	5	6.8	11	15.1
Neoplasms	50	2	4	4	8	6	12
Endocrine, metabolic and immunologic disorders	59	—	0	2	3.4	2	3.4
Diseases of the blood and blood forming organs	9	—	0	1	11.1	1	11.1
Mental disorders	43	—	0	1	2	1	2
Diseases of the nervous system and sense organs	31	—	0	—	0	—	0
Diseases of the circulatory system	156	1	0.6	7	4.5	8	5.1
Diseases of the respiratory system	67	11	16.4	7	10.4	18	26.9
Diseases of the digestive system	165	—	0	3	1.8	3	1.8
Diseases of the genitourinary system	60	—	0	1	1.6	1	1.6
Diseases of the skin and subcutaneous tissue	12	2	16.7	—	—	2	16.7
Diseases of the musculoskeletal system and the connective tissue	38	5	13.2	8	21	13	34.2
Poisonings	14	3	21.4	—	—	3	21.4
Symptoms, signs and ill-defined conditions	9	—	—	1	11	1	11
Total	786	30	3.8	40	5	70	8.9

Table 3. Proportion of patients with illnesses (primary + secondary + antecedents) probably or possibly related to occupations in various occupational groups. ILO = International Labour Office)

Occupational group ^a	Total number of patients	Patients with work-related disorders	
		N	%
Professional, technical and related workers (ILO 0,1)	49	10	20
Administrative and managerial workers (ILO 2)	13	2	15
Chemical and related workers (ILO 3)	40	1	2.5
Sales workers (ILO 4)	13	2	15.5
Service workers (ILO 5)	13	3	23
Agricultural, animal husbandry and forestry workers, fishermen and hunters (ILO 6)	6	6	100
Production and related workers, transport equipment operators and laborers (ILO 7—9)	66	27	41

^a Code of the International Standard Classification of Occupations in parentheses.

Table 4. Chemical, physical, and biological agents probably or possibly responsible for the work-related illnesses (primary + secondary + antecedents).

	Probably responsible	Possibly responsible	Total
Chemical agents			
Carbon monoxide	2	3	5
Silica (associated or not with coal dust)	6	1	7
Asbestos	2	2	4
Other dusts	1	2	3
Lead	—	2	2
Solvents	1	5	6
Others	4	7	11
Total	16	22	38 (54 %)
Physical agents			
Lifting and posture	4	10	14
Vibration	1	2	3
Ultraviolet rays	2	—	2
Cold	1	2	3
Total	8	13	21 (30 %)
Biological agents			
Hepatitis B virus	2	2	4
Other	4	3	7
Total	6	5	11 (16 %)
Total	30	40	70

tivity since they were based on the interpretation of a questionnaire and an interview. They could not always be strengthened by objective data (eg, quantitative assessment of past exposure by environmental and/or biological data). Furthermore some reported associations are still the subject of controversy, such as the relationship between the development of coronary artery disease and long-term exposure to carbon monoxide (48).

Respiratory tract impairments were the most frequent work-related diseases. This finding confirms that the lung represents the main target organ of many inhaled industrial pollutants. The finding is in agreement both with the observations of Cullen & Cherniack in the United States (2) and statistics of the Belgian Work Compensation Fund (49). In 1987, 30 % of the claims received by the Belgian Fund were related to occupational lung diseases. In the present study, the propor-

tion of work-related infectious diseases (10 of the total 70) was higher than that (4 %) found among the compensation claims introduced to the Belgian Work Compensation Fund in 1987 (49), even though compensation claims for most of the diagnosed infectious diseases can be directly submitted for work compensation by the patient or his or her physician. One expects that most work-related infections rapidly heal and therefore do not always lead to a compensation claim, unlike respiratory and osteomuscular diseases.

Doll & Peto (50) attributed 2 to 8 % of the cancer deaths among the general population (active + non-active persons) in the United States to occupations. Our estimation (6 of 50 neoplastic diseases) is higher since it is based on occupationally active persons. In Belgium, the majority of occupational cancers is not reported to the health and safety inspectorate or the compensation board. Over the eight-year period 1979–1986, the average annual number of cancer cases compensated by the Belgian Work Compensation Fund was only 48, compared with an annual number of approximately 4000 compensated occupational diseases (51). In 1983, of 12 869 cancer cases registered for men by the Belgian Cancer Registry, 68 (0.5 %) were submitted to the Belgian Work Compensation Fund (51). Although hearing loss and skin lesions are frequent occupational health problems, very few patients with these complaints were found in the study. These patients would not normally be hospitalized.

In summary, over 25 % of hospital inpatients in general internal medicine who have held employment have or have had work-related pathologies. This finding justifies a detailed occupational record for all employed patients admitted to any other medical ward (eg, pneumology, oncology, hematology, nephrology, gastroenterology, neurology). Although respiratory and orthopedic conditions are more frequently related to occupation than other diseases, any organ can be the target of an occupational hazard. Medical criteria alone are not sufficient to identify the patients whose illness may be work-related and for whom a detailed work history should be obtained by an expert physician. Accurate and systematic work histories must be obtained for each patient. Several authors (52–57) have stressed the importance of training internists (and general practitioners) to consider work-related causes in their diagnoses. However, in view of the complexity and rapidly changing pattern of occupational health risks, it is unlikely that internists will ever be able to assess in detail the present and past occupational history of their patients. Industrial position titles (as listed in table 1) do not frequently permit the assessment of potential occupational hazards. Furthermore current employment is not always representative of usual occupational exposure conditions (58). A detailed inquiry about each patient's past and present activities is required to pinpoint exposure to any occupational health risks. This task can only be performed by an occupational physician because it not only involves the

description of current and previous occupational exposure conditions, but also the assessment of a possible link between the diagnosed pathology and the occupational activities.

It should also be stressed that correct, careful, and accurate work records are not only central for deciding whether a patient presents an occupational disease, they may also contribute to the identification of new occupational health risks. Indeed, this information constitutes an essential tool for the proper design of epidemiologic studies.

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