INCIDENCE OF CONCURRENT SYSTEMIC DISEASE IN THE SURGICAL POPULATION OF A TERTIARY CARE HOSPITAL

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ABSTRACT

A retrospective analysis was made of the case records of 1568 surgical patients admitted in 1975 to a tertiary care hospital in the Province of Newfoundland, to determine and classify the incidence of concurrent systemic disease. Almost 60 percent of patients had symptoms or signs of concurrent disease, the numbers increasing progressively from below 30 per cent at 21–30 years, to 90 per cent at ages 71–80. The predominant abnormalities were cardiovascular (60 per cent), followed by respiratory and metabolic conditions (41 and 40 per cent respectively).

Detailed findings are presented, including those relating to the incidence of ischaemic heart disease and hypertension, to the coexistence of several diseases, to smoking and chronic obstructive lung disease, to obesity, to diabetes, and to alcoholism.

This review documents the high incidence of concurrent disease in surgical patients and has implications for the training of anaesthetists and the organization of their work.

KEY WORDS: SURGERY, concurrent disease; COMPLICATIONS, concurrent disease.

THE INCIDENCE of concurrent systemic disease in surgical patients has obvious relevance to the work and staffing of departments of anaesthesia, and to the training and responsibilities of anaesthetists. There have been several reports relating to British hospitals, but little information from North America. We believe that it is of interest to analyze and document this aspect of anaesthetic practice, and we present here our report from 1568 unselected surgical patients treated in 1975 in a tertiary care hospital serving the Province of Newfoundland and Labrador.

METHODS

Surgical case records from the year 1975 were extracted randomly from the files by a staff member of the Department of Medical Records, and were then reviewed by one of us (R.W.). The 1568 cases analyzed were a large and unselected sample representative of the 5825 surgical patients operated on in that year in St. John's Gen-

eral Hospital, which is a tertiary care centre for the Province of Newfoundland and Labrador. At that time, the total bed complement was approximately 320.

So far as possible, only concurrent disease which appeared to be unrelated to the reason for surgical intervention was included.

General surgical patients comprised the highest number; other specialties included neurosurgery, urology, plastic, orthopaedic, and ophthalmic surgery. In 1975 few patients were admitted for cardiac or peripheral vascular surgery, and the data represent essentially a hospital without these services. There were no obstetrical or paediatric departments (under 15 years), and only a small number of gynaecological patients. There was a substantial emergency load, involving mainly general, orthopaedic, and plastic surgery.

Patients were classified into two Groups: Group 1, without evidence of concurrent systemic disease; Group 2, with abnormalities which were categorized as follows: cardiovascular, respiratory, metabolic, central nervous, haematological, musculoskeletal, gastrointestinal, and genitourinary.

The age ranges adopted for analysis were the seven decades from 21 years, although reference is made to the smaller number of patients aged 15–20 years.

It should be noted that many patients showed more than one abnormality, yet are included

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TABLE I

Age (yrs)	15-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	Combined
Group 1										
n	144	189	139	93	42	29	12	—	—	648
Males	88	108	79	54	18	19	7	—	—	373
Females	56	81	60	39	24	10	5	—	—	275
Group 2										
n	43	81	100	158	203	180	109	42	4	920
Males	21	41	44	92	123	112	62	24	3	522
Females	22	40	56	66	80	68	47	18	1	398
Combined										
Total	187	270	239	251	245	209	121	42	4	1568
Males	109	149	123	146	141	131	69	24	3	895
Females	78	121	116	105	104	78	52	18	1	673

Sex and age distribution of all patients in Group 1 (healthy) Group 2 (with disease), and both Groups together. The figures are the actual numbers of patients in each age range, and all ages combined.

under each disease heading; thus the sum of the numbers in all the categories exceeds the total number of patients.

Anaemia was recorded when haemoglobin concentration was less than 11.5 g/dl in males, and 11 g/dl in females. A figure of 10 g/dl was required before anaesthesia was undertaken, except in extreme emergency or in patients with chronic renal failure.

Arterial hypertension was taken as 21.3/11.9 kPa (160/90 mmHg) and above.

While much of the information derived by retrospective review of the case records was specific, reservations apply to the incidence of obesity, which was based usually on written comments (weights often being unmeasured); also to "heavy smokers" (one pack or more of cigarettes per day, as recorded in the case-notes); and to alcohol consumption (specific mention was again required). Since information was more likely to be incomplete, the data probably reflect an underestimate of these features.

In the tables, numbers of patients below five have not been converted to percentages; in the figures, plots of the restricted age range of 15-20 years have been omitted.

RESULTS

Nine hundred and twenty of the 1568 patients (59 per cent) showed evidence of concurrent systemic disease and were included as Group 2. Data relating to age and sex for these, for the remaining 648 apparently healthy patients comprising Group 1, and for both Groups together, are summarized in Table I.

In Group 1 (healthy), 58 per cent were males, a similar male to female ratio being maintained

FIGURE 1 Distribution of male patients in each age range, plotted separately for Groups 1 and 2, and expressed as a percentage of total males in the Group.

through most of the age ranges; exceptions were an excess of females at 51-60 and of males at 61-70 years.

Sex differences were more marked in the Group 2 patients, although the average of 57 per cent males was virtually identical to that for Group 1. Up to age 30, there were similar numbers of males and females in Group 2; at 31-40 years, females predominated, and at all higher ages males comprised about 60 per cent.

Patients over 40 years made up 27 per cent and 60 per cent of Groups 1 and 2 respectively. The age distributions differed substantially in the two Groups and are plotted for males in Figure 1. The data for females were broadly similar, the differences resulting in an almost "normal" curve of age distribution among Group 2 patients of this sex.

From the numbers in Table I, it can be calculated that patients "with disease" comprised 30

FIGURE 2 Percentage of males and females in each age range, for Group 1 and 2 combined.

per cent of all those (i.e. both Groups combined) in the age range 21–30 years; at 31–40 years a bias toward associated disease began, 42 per cent of patients being in this category. Then at 41–50, 51–60, 61–70, and 71–80 years, the numbers with concurrent disease increased progressively to 63, 83, 86 and 90 per cent respectively of all patients at these ages.

Emergency admissions comprised 17.6 and 15.6 per cent of Groups 1 and 2. In 33.5 per cent of the elective admissions in Group 2, and in 63.5 per cent of the emergency cases of this Group, medical treatment was undertaken before surgical intervention.

In respect to hospital admissions for the two groups combined, Figure 2 shows the percentage of the total males and females (from Table I) within each age range. The proportions remained relatively constant through the decades from 21–30 to 61–70; combining both sexes, by inspection of Figure 2, shows that the age ranges 31–40, 41–50, and 51–60 years each included just over 15 per cent of the total admissions, while a figure about two per cent higher and lower respectively applied to ages 21–30 and 61–70.

More than one disease was recorded in many patients, and the data presented, except where mentioned, relate to the frequency of involvement of a single system regardless of whether others were affected.

Figure 3 shows the incidence of disease in males and females in the eight categories, each being expressed as a percentage of all Group 2 patients of the same sex; these and additional data are combined in Table II. The predominant disorders were cardiovascular, followed by respiratory and metabolic conditions. Thus, of all 920 patients of Group 2, the cardiovascular system was affected in 60 per cent, while respiratory and metabolic abnormalities occurred in 41 and

FIGURE 3 Percentages of male and female patients in Group 2 who showed disease in the eight classifications. Individual percentages refer to a single category, and cannot be added, since many patients showed more than one abnormality.

40 per cent respectively (Table II). Disease in the other five systems was much less frequent.

Table II also includes the incidence of disease in the combined Groups, comprising all 1568 patients studied. (This does not necessarily reflect the frequency of these disorders in the general population of Newfoundland, in view of factors influencing the selection of patients admitted to this hospital.)

The numbers in parenthesis in Table II refer to patients with a single concurrent disease, it being evident that the majority had involvement of two or more systems; for example, fewer than 1 in 3 of male and female patients with cardiovascular disease showed evidence of this only, while respiratory conditions without additional abnormality occurred even more rarely.

Cardiovascular System

The incidence of cardiovascular disease at different ages is shown in Table III, which includes the numbers expressed as a percentage of all patients of the same sex in each age range from Group 2. The increasing frequency with advancing age is seen clearly and in Figure 4, in which the percentage incidence in male patients is plotted. From above about 30 years, to age 90, there was an almost linear increase in the percentage of males in each age range whose disease, if detected, affected the cardiovascular system. Figure 4 also includes a plot of the percentage incidence of cardiovascular disease at different ages in all male patients—“healthy” and with concurrent disease (Groups 1 and 2 combined). Both plots in Figure 4 show a steep rise between about 30 and 60 years, after which there is a levelling-out before a further ascent above age 70. The data for females are very similar (Table III), except for

TABLE II

	Cardio-vascular	Respiratory	Metabolic	CNS	Haematological	Musculo-skeletal	Gastro-intestinal	Genito-urinary
Male	317(82)	273(45)	199(26)	60(18)	36(4)	42(6)	40(5)	28(4)
Group 2	60.7%	52.3%	38.1%	11.5%	6.9%	8.1%	7.7%	5.4%
Groups 1 & 2	35.4%	30.5%	22.2%	6.7%	4.0%	4.7%	4.5%	3.1%
Female	234(72)	103(12)	170(38)	58(13)	57(15)	50(12)	28(2)	23(4)
Group 2	58.8%	25.9%	42.7%	14.6%	14.3%	12.6%	7.0%	5.8%
Groups 1 & 2	34.5%	15.3%	25.3%	8.6%	8.5%	7.4%	4.2%	3.4%
Both Sexes	551(154)	376(57)	369(64)	118(31)	93(19)	92(18)	68(7)	51(8)
Group 2	59.9%	40.9%	40.1%	12.8%	10.1%	10.0%	7.4%	5.5%
Groups 1 & 2	35.1%	24.0%	23.5%	7.5%	5.9%	5.9%	4.3%	3.3%

Numbers of patients classified in the eight systems in Group 2, also expressed as a percentage of those of the same sex in that Group, and of both Groups. The figures in parentheses refer to patients with only one system affected.

TABLE III

Age (yrs)	15-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	>90	Total
Male	4	8	14	46	84	82	54	22	3	317
Group 2	—	19.5%	31.8%	50.0%	68.3%	73.2%	87.1%	91.7%	—	60.7%
Female	3	8	18	31	60	56	42	15	1	234
Group 2	—	20.0%	32.1%	47.0%	75.0%	82.4%	89.4%	83.3%	—	58.8%

Incidence of cardiovascular disease in different age ranges.

The numbers are also expressed as percentages of all patients in Group 2 of the same sex and age range.

TABLE IV

Age (yrs)	15-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	>90	Total
Male	—	2	5	21	46	48	28	14	3	167
C-V disease	—	—	35.7%	45.7%	54.8%	58.5%	51.9%	63.6%	—	52.7%
Group 2 males	—	—	11.4%	22.8%	37.4%	42.9%	45.2%	58.3%	—	32.0%
Groups 1 and 2	—	—	4.1%	14.4%	32.6%	36.6%	40.6%	58.3%	—	18.7%
Female	1	—	7	8	26	26	20	7	1	96
C-V disease	—	—	38.9%	25.8%	43.3%	46.4%	47.6%	46.7%	—	41.0%
Group 2	—	—	12.5%	12.1%	32.5%	38.2%	42.6%	38.9%	—	24.1%
Groups 1 and 2	—	—	6.0%	7.6%	25.0%	33.3%	38.5%	38.9%	—	14.3%

Incidence, by sex and age, of symptoms or signs of ischaemic heart disease. The numbers are also expressed as percentages of all those with cardiovascular disease, of Group 2 patients, and of Groups 1 and 2 combined, of the same sex and age range.

FIGURE 4 Numbers of males with cardiovascular disease, expressed as a percentage of Group 2 patients, and of both Groups, in the same sex and age range.

higher percentage incidences, in both plots, for age 61-70 years (thus, the lines of ascent are straighter).

The 551 patients with cardiovascular disease frequently showed other abnormalities. Most commonly, in 194, these were respiratory; of the latter number, there was further pathology in one additional system in 83, in two systems in 19, and in three systems in three patients. The occurrence of cardiovascular disease alone (154) approximately equalled that with one additional non-respiratory abnormality (146). There was a

marked overall sex bias in patients with both cardiovascular and respiratory disease, especially in males at ages 51-70 and in the adjacent decades. A similar but less striking male predominance occurred in patients at these ages with disease in the cardiovascular system alone.

In the overall 60 per cent incidence of cardiovascular abnormalities in Group 2 patients, ischaemic heart disease and hypertension dominated. The division into sex and age incidences for these two conditions is shown in Tables IV and V. The sharp increase in ischaemic heart disease in males is obvious at 41-50 years, while its occurrence in females rises similarly in the age range 51-60 (Table IV). Above this there is a persistent but reducing male bias. In males above age 50, arterial hypertension and cardiac ischaemia contributed to a similar extent to the overall occurrence of cardiovascular disease. At all ages in females, however, hypertension was commoner than ischaemic heart disease. In Figure 5, where the incidences of raised arterial pressure and ischaemic heart disease in the total population of patients (Groups 1 and 2 combined) are plotted separately for sex and age ranges, the predominance of hypertension in females is clearly shown. The overall incidence of hypertension for the combined Groups averaged 24.7 per cent for females and 21.5 per cent for males (Table V); for ischaemic heart disease, the com-

TABLE V

Age (yrs)	15-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	Total
Male	2	5	7	34	50	51	31	12	192
C-V disease	—	62.5%	50%	73.9%	59.5%	62.2%	57.4%	54.6%	60.6%
Group 2 males	—	12.2%	15.9%	37.0%	40.7%	45.5%	50.0%	50.0%	36.8%
Groups 1 and 2	—	3.4%	5.7%	23.3%	35.5%	38.9%	44.9%	50.0%	21.5%
Female	2	4	12	20	44	45	29	10	166
C-V disease	—	50%	66.7%	64.5%	73.3%	80.4%	69.1%	66.7%	70.9%
Group 2 females	—	10%	21.4%	30.3%	55%	66.2%	61.7%	55.6%	41.7%
Groups 1 and 2	—	3.3%	11.4%	19.1%	42.3%	57.7%	55.8%	55.6%	24.7%

Incidence of arterial hypertension by sex and age. The numbers are also expressed as percentages of all those with cardiovascular disease, of Group 2 patients, and of Groups 1 and 2 combined, of the same sex and age range.

FIGURE 5 Male and female patients with ischaemic heart disease and arterial hypertension, as percentages of all those of the same sex and age category (Groups 1 and 2 combined)

parable figures were 14.3 and 18.7 per cent respectively (Table IV).

The third most frequent cardiovascular abnormality was of conduction or rhythm; the commonest (42 patients) was conduction block, followed by atrial fibrillation (19), and premature ventricular contractions (18). In all these conditions, males were more frequently affected. The peak incidence for conduction block occurred above 50 years; for atrial fibrillation, above 60 years; and for premature ventricular contractions, at 51-60 years.

The commonest factor associated with disturbances of cardiac conduction or rhythm was ischaemic heart disease, recognized in 45 (55.6 per cent) of such patients, in 20 of whom arterial hypertension was also present. There was an association with arterial hypertension alone in another 10 patients, and with mainly valvular disease in seven. In 19 patients, almost all above 50

years, there was no association with manifest cardiac disease; however, in the 18 patients who had ventricular ectopic beats before operation, only four appeared to be free of coexisting cardiovascular abnormality. The 58 patients with peripheral vascular disease included 41 males, 29 of whom were aged 51-70 years. The youngest patient was 48 years, and the range extended to above age 90.

Of 24 patients with valvular disease, 14 were under age 40, the remainder being spread evenly over the higher decades to 80 years. Overall, there was no clear sex difference.

Congestive heart failure, present just before operation, affected predominantly older patients regardless of sex; none was less than 50 years of age, the maximum number (9) occurred in the age range 71-80, and six other patients were between 81 and 95 years.

Differences in sex incidence were more obvious in respect to cerebrovascular disease, which appeared first above 50 years, recorded a peak of 16 cases at age 61-70 where more than twice as many males as females were affected, and included a further nine patients in the range 71-80 years, where there was little sex difference.

A "miscellaneous" category of cardiovascular disorder included four cases of Raynaud's disease (all heavy smokers), cardiomyopathy (3), pulmonary embolism (2), deep venous thrombosis (2), cardiac hypertrophy, ventricular aneurysm, post-traumatic thoracic aneurysm, temporal arteritis, "hypotension", and post-cardiac-arrest.

An association between cardiovascular abnormality and heavy smoking (recorded here as 1 pack or more per day) was not striking. In the ischaemic heart disease and arterial hypertension categories 27 per cent and 26 per cent of males smoked heavily, compared to only 5.2 and 8.4 per

TABLE VI
RESPIRATORY DISEASE

Age (yrs)	15-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	> 90	Total
Male	5	22	22	61	74	50	28	10	1	273
Group 2	23.8%	53.7%	50.0%	66.3%	60.2%	44.6%	45.2%	41.7%	—	52.3%
Groups 1 & 2	4.6%	14.8%	17.9%	41.8%	52.5%	38.2%	40.6%	41.7%	—	30.5%
Female	5	7	13	22	20	18	15	2	1	103
Group 2	22.7%	17.1%	23.2%	33.3%	25.0%	26.5%	31.9%	—	—	25.9%
Groups 1 & 2	6.4%	5.8%	11.2%	21.0%	19.2%	23.1%	28.9%	—	—	15.3%
Total patients	10	29	35	83	94	68	43	12	2	376
Group 2	23.3%	35.8%	35.0%	52.5%	46.3%	37.8%	39.5%	28.6%	—	40.9%
Groups 1 & 2	5.4%	10.7%	14.6%	33.1%	38.4%	32.5%	35.5%	28.6%	—	24.0%

Age and sex incidence of patients with respiratory disease; numbers, in the same sex and age range, are expressed as percentages of patients in Group 2, and in Groups 1 and 2.

cent of females. The peak age for ischaemic heart disease was 51-70 years in both sexes, and 24.5 per cent of the males smoked, whereas in the years of increasing incidence, 41-50, there were 47.6 per cent who smoked. The highest percentage of females with ischaemic heart disease who smoked, at ages 51-60 years, was only 15.4 per cent, and at 61-70 years there were no recorded smokers in the 26 female patients.

Among the 58 patients recorded as having peripheral vascular disease, 51.2 per cent of the 41 males and 23.5 per cent of the 17 females were "heavy" smokers.

Respiratory System

A total of 376 patients, 273 males and 103 females, were included under three subdivisions: chronic obstructive lung disease, including "asthma"; "heavy" smokers (a pack or more per day); and "old" tuberculous infection. There was also a much smaller miscellaneous group, which will not be discussed in detail, with the following conditions: bronchiectasis (5), pneumonia (3), pulmonary fibrosis (3), carcinoma (3), respiratory failure (3), pneumonconiosis (3), pleural effusion (2), and one each of myasthenia gravis, sarcoidosis, pulmonary infarction, hamartoma, coccidioidomycosis, and pneumothorax.

Table VI shows the age and sex distribution of all patients classified under respiratory disease. At all ages above 20 years, the number of males exceeded that of females by up to about 3 to 1. Overall, just over half the males in Group 2, and one quarter of the females, showed respiratory conditions.

The largest category, the smokers, numbered 228. There were 144 patients with "chronic obstructive lung disease" (including asthma), 118 with evidence of 'old' tuberculous infection, and

28 with the miscellaneous conditions referred to above.

At all ages above 20 years, far more males than females smoked; 35.6 per cent of the males of Group 2 were smokers, compared to 10.6 per cent of the females. In the decades 41-50 and 51-60 years, the proportion of smokers showing chronic obstructive lung disease was similar in the two sexes (23.1 and 48.1 per cent in males; 25.0 and 45.5 per cent in females). Over age 60 there were few females, with a lower incidence of chronic obstructive lung disease.

The percentage of males with chronic obstructive lung disease (21.1 per cent of Group 2) greatly exceeded that of females (8.0 per cent); of these patients, 65.8 per cent of males and 48.9 per cent of females were smokers.

For males aged 41-80 years, it appeared that about half to two-thirds with chronic obstructive lung disease were smokers; of all smokers in this age range, however, a smaller proportion had diagnosed chronic obstructive lung disease. The data for females led to a similar conclusion.

A substantial number of patients, 74 males and 44 females, had evidence of previous tuberculous infection, recognized usually by chest radiography. While the infection was probably inactive in the great majority of patients (only three were recorded as "active") the element of doubt and the unusual frequency prompted their inclusion in Group 2. Patients with associated chronic obstructive lung disease numbered 23 males (three labelled "asthma") and 5 females (one "asthma"), comprising respectively 31.0 and 11.4 per cent of those with evidence of old tuberculous infection. Neither these figures, nor the 32.4 per cent of males and 13.6 per cent of females who smoked, are in excess of the overall frequencies in Group 2.

Metabolic Disease

A total of 369 patients, 199 males and 170 females, were included in this category. The subdivisions were: obesity (199 patients); diabetes or hyperglycaemia (102); alcoholism (64), endocrine conditions (hyperthyroidism, 2; hypothyroidism, 9; hyperparathyroidism, 3; adrenal hyper or hypofunction, one each). An additional miscellaneous category was used for 38 patients, to include conditions such as liver disease, hypercholesterolaemia, gout, and other less frequent disorders, which will not be considered further.

At all ages, obesity was more common in females, with a marked rise at age 51–60 years. Overall, 28.4 per cent of Group 2 female patients, and 16.8 per cent of all female admissions were recorded as obese; the comparable figures for males were 16.5 and 9.6 per cent respectively. Of the 113 obese females, 34 were 40 years or under, and 56 per cent of these showed another abnormality; for the under-40 obese males, the comparable figure was 60 per cent. In patients over 40 years of age, 90.9 per cent of obese females, and 92.4 per cent of males, had other concurrent disease. In male and female obese patients, respectively, aged 31–80 years, the incidence of the following were recorded: another concurrent disease (86.1 and 88 per cent); arterial hypertension (54.2 and 50 per cent); ischaemic heart disease (29.2 and 34.8 per cent); diabetes (9.7 and 16.3 per cent); and alcoholism (15.3 and 1.1 per cent). The incidence of an additional condition, and notably of hypertension, was obviously high in obese patients.

There were 33 male and 36 female known diabetics, who showed an erratic age and sex distribution, the maximum numbering 19 at 61–70 years. An additional 33 patients showed hyperglycaemia on more than one occasion while in hospital. When the numbers of diabetic and hyperglycaemic patients were combined and expressed as a percentage of Group 2 patients in the same age range, a progressive increase with age was apparent, from 6.0 per cent at 31–40 years to 26.2 per cent at 81–90 years.

Diabetic patients who were obese numbered 17 of 36 females (47.2 per cent) and 7 of 33 males (21.2 per cent).

Alcoholism (a known or deduced high alcohol intake) was recorded in 64 patients, only four of whom were female (ages 21, 57, 59, and 68 years). Two of the 60 males were less than 20 years of age; there were 10 in each of the ranges 21–30 and 31–40 years; ages 41–50 and 51–60 included 14 and 15 males respectively (these numbers repre-

sented 15.2 and 12.2 per cent of Group 2 males of that age); at 61–70 and 71–80 years there were a further five and four patients. The 60 males with alcoholism comprised 11.5 per cent of all Group 2 males, and 6.7 per cent of all male admissions. Only five alcoholic patients (7.8 per cent all male) were free of other disease; over age 40, the figure was even lower, at 4.6 per cent.

Central Nervous System

Sixty males and 58 females were categorized as follows: depression (32); psychosis (20); seizures (13); cerebral tumors (10); functional illness (9); Parkinsonism (6); and a miscellaneous group (29) which included lesions of the spinal cord, cerebral atrophy or palsy, and drug abuse.

Haematological Conditions

The majority (84) of the 93 patients in this category were classified as anaemic, with haemoglobin less than 11.5 g/dl in males, and 11.0 g/dl in females. Overall, 14.1 per cent of females of Group 2 were included, with a frequency up to 60 years at least three times that in males. After age 60, the figures were spread erratically, but an increase in males was evident. Eighteen (21.4 per cent) of anaemic patients were without other concurrent disease.

Eleven patients (age range 16–80 years, five males) had other blood or lymphatic disorders: Hodgkin's disease (4), thrombocytopaenia (2), leukaemia (2), and one each of congenital lymphoedema, Factors 12 and 8 deficiency, and polycythaemia. In regard to the latter condition, this study did not include a numeration of the frequency of high haemoglobin concentrations, which may have been common in males.

Musculo-skeletal System

The 92 patients included 42 males and 50 females and were classified as osteoarthritis (34 patients, ages 42–86 years, 15 males); rheumatoid arthritis (18 patients, ages 27–77 years, three males); scoliosis (15 patients, ages 18–65 years, six males); and a miscellaneous group of 21 patients. The latter included spondylolisthesis (eight patients, all but one with cervical disease, seven males); gout (five male and one female); osteoporosis (three female); and one each of muscular dystrophy, dystonia, congenital dislocation of hip, and lumbar disc protrusion.

Gastrointestinal Conditions

The 40 male and 28 female patients were classified into four categories. The commonest

condition, duodenal ulcer, affected 19 males and only five females (spread across ages 23–68 years); gastric ulcer in 15 patients (age range 28–70 years) occurred in 10 males; hiatus hernia, with an even sex distribution in 15 patients, was most frequent at ages 51–60 years (7); the fourth category of miscellaneous conditions in 15 patients (five male) included five cases of diverticulitis, three of Crohn's disease, two of Whipple's disease, and single instances of ulcerative colitis, umbilical hernia, cholecystitis, gastrointestinal fistula, and pyloric stenosis.

Genitourinary System

The 51 patients, 28 males and 23 females were classified under renal failure (13, age range 23–86 years, 8 male), renal calculi (18, age range 31–69 years, 10 male), and a miscellaneous group (15, age range 15–73 years, 7 male); the latter included renal tuberculosis (4), recurrent urinary tract infection (4), renovascular hypertension (2), and one each of polycystic disease, horseshoe kidney, hypernephroma, analgesic nephropathy, and chronic glomerulonephritis.

Medication

A total of 565 patients were receiving drugs on admission, comprising 61.4 per cent of Group 2. Two hundred and ninety-one of these (31.6 per cent of Group 2) were taking a single drug, and 247 (29.8 per cent) had been given two or more medications. The commonest drugs were diuretics (118 patients), with digoxin and nitroglycerin also contributing substantially to the 324 instances when cardiovascular therapy was used. In descending frequency of usage were sedatives, mild analgesics, antibiotics, and contraceptives (probably underestimated from lack of information in case-histories), antidepressants, hypoglycaemic agents, anticonvulsants, steroids, bronchodilators, and a miscellany of other drugs.

Surgical Conditions

The specialties contributing most to the total of 5825 surgical operations performed in this hospital in 1975 were: "general" surgery (21 per cent), which included a small number of thoracotomies and peripheral arterial grafts; orthopaedics (23 per cent); genitourinary (16 per cent); and neurosurgery (8 per cent) including discolideotomy and laminectomy. The corresponding percentage of the cases from each of these specialties among the Group 2 patients was 34, 22, 14, and 11 per cent respectively. This rough comparison shows that a majority of the patients with concur-

rent systemic disease were undergoing general surgical and orthopaedic operations, and that systemic disease was more common in these fields.

DISCUSSION

The general finding from this study is that approximately 60 per cent of patients admitted for surgery had symptoms or signs of concurrent systemic disease, which were usually distinct from the reason for operative intervention. The hospital functions as the tertiary care centre for the Province of Newfoundland and Labrador, to provide specialized investigations and treatment, and also admits patients for relatively minor routine surgery, sometimes as day cases. Over the time period of the study there were few gynaecological procedures and the cardiac and vascular surgical services were at an early stage of development, so that separate classification in these categories was unjustified. There are no obstetrical or paediatric departments. These factors influence comparisons with other published data. While every surgical specialty is becoming more and more involved with an aging population, and the scope of operative intervention in patients with severe degenerative disease is widening progressively, such influences will be especially marked in certain areas, for example in vascular surgery.

The probability of error in retrospective reviews of case records is obvious and considerable. Everyday hospital experience suggests, however, that information is more likely to be omitted rather than exaggerated, and this may be relevant, for example, to obesity, smoking habits, and alcohol consumption. There may also be controversy over the method of classification used here in respect to anaemia, to "heavy" cigarette smoking, and to the inclusion of smokers in the category of respiratory disease regardless of symptoms and signs.

Since selective admission is a feature of tertiary care hospitals, the patient population may differ from that in the outside community. Certain patterns were similar, however. There was an increased incidence of "other disease", particularly hypertension, in obese patients; female, but not male, diabetic patients were commonly obese; there were more males than females with respiratory disease, which showed the expected association with cigarette smoking. The frequency of arterial hypertension was of special interest in this study, occurring in 24.7 per cent of

females and 21.5 per cent of males admitted to hospital. Comparable figures, averaged from four communities in Newfoundland, are 28.1 and 21.3 per cent respectively (Fodore, G. personal communication). Both sets of data are much closer to those from the black population of the United States (29.7 per cent in females, 27.8 per cent in males), than to the incidence there in white females (15.1 per cent) and males (13.0 per cent).

Previous publications have enumerated the incidences of medical disease in surgical patients in England, as follows: 30¹, 40², 35³ per cent from pre-anaesthetic out-patient clinics. Other figures are 56 per cent in a predominantly elderly population undergoing hip surgery,⁴ and 35 per cent in mainly younger patients admitted to hospital for dental surgery.⁵ In these and other⁶ reports, as in the present study, the influence of age is dominant, as is a high incidence of cardiovascular and respiratory disease.⁷

Since the coexistence of systemic disease is closely related to the type of surgery, the figures reported here are not necessarily relevant to other environments. Nevertheless, our findings emphasize that the anaesthetist is now concerned with a wide spectrum of concurrent systemic dis-

ease and that this will become broader and commoner as more elderly people undergo surgical operations. It may be concluded, with obvious medicopolitical and educational implications,⁸ that anaesthetists should have a wide knowledge of systemic disease, which they should continue to expand throughout their years of practice.

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RÉSUMÉ

Une étude rétrospective des dossiers de 1568 malades opérés en 1975 dans un hôpital de soins tertiaires de Terre-Neuve a été effectuée dans le but d'identifier et de classer les atteintes systémiques d'ordre médical accompagnant la pathologie chirurgicale. Près de 60 pour cent des opérés présentaient des symptômes cliniques ou des signes d'atteintes d'ordre médical en plus de leur pathologie chirurgicale, l'incidence inférieure à 30 pour cent retrouvée dans le groupe des 20 à 30 ans s'élevant graduellement avec l'âge jusqu'à 90 pour cent chez les plus de 70 ans. Le système cardiovasculaire était le plus fréquemment en cause (60 pour cent), suivi par le système respiratoire (41 pour cent) et les affections métaboliques (40 pour cent).

Les résultats détaillés sont présentés, incluant ceux pertinents à l'incidence des maladies cardiaques ischémiques et de l'hypertension artérielle, à la présence simultanée de plusieurs atteintes d'ordre médical, au tabagisme et aux maladies pulmonaires obstructives, à l'obésité, au diabète et à l'alcoolisme.

Cette étude vient confirmer la haute incidence de pathologies médicales accompagnant les atteintes d'ordre chirurgical. On devrait en tenir compte dans l'orientation de l'entraînement et dans l'organisation du travail des anesthésistes.