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THE HEALTH OF THE DOCTOR*

BY

A. HOPE GOSSE, M.D., F.R.C.P.

Physician to St. Mary's Hospital and the Brompton Hospital

I chose for this address the subject of mortality and morbidity among medical men because I believe I have had unique experience of this subject, and have access to innumerable records in connexion with it. I shall unfold to you the causes of death, as well as the amount of ill-health and its various causes, among medical men who start with good average health, after medical examination, at the average age of 30 and are followed up until 60 or 65 years old. I shall then deal with the claim that coronary thrombosis is the "doctor's disease." The family history of those who develop coronary thrombosis and pulmonary tuberculosis will be contrasted with that of the healthiest members of the profession who are still in active practice at the age of 65.

It is important to remember that this experience applies to those who enjoy good health at the average age of 30 and have a good prognosis for health and life. As it would have been an insuperable task for me, even if it were worth while, to analyse the records of all the years, 1938 was chosen for a detailed analysis as it was the last pre-war year and there was no epidemic.

In that year there were under observation 8,884 medical men drawn from all branches of the profession, including dental surgeons. Their ages ranged from 25 to 65 in the following age groups: 25 to 35, 2,411; 35 to 45, 3,604; 45 to 55, 1,799; 55 to 65, 1,070. The average age at which the men came under observation was just over 30 years, and they were not followed after 65 years of age. The ill-health of the doctor will be divided into those diseases which cause death, and those which cause disablement from following any part of his professional work for a period of at least 7 days, such disability being certified by a registered medical practitioner. Illness causing inability to work for any period shorter than 7 days was not observed, and is not included in this analysis. The source of my material is such that the investigation can be regarded as based on complete and reliable records. I have been unable to find any comparable figures (for total numbers, accuracy of records, and the number of years followed up) either for the medical or for any other profession or grade of worker.

Mortality Rate

I shall now deal with the mortality of doctors during their most strenuous working years from the ages of 25 to 65, based on the deaths in 1938 among the 8,884. Deaths occurred in all decades and in the following numbers:

Ages	Nos. Observed	Deaths	% Deaths
25-35	2,411	8	0.33
35-45	3,604	9	0.24
45-55	1,799	8	0.44
55-65	1,070	16	1.5

In 1938, however, the death rate of ages 25 to 35 was noted to be high, with 8 deaths, so the same decade for 1939 was

analysed. It showed only 3 deaths out of approximately the same numbers of doctors, a percentage of 0.12—a fairer figure for the annual experience of that decade. With this corrected figure it will be noted that the annual death rate increases in each decade, as we would expect, but in the following ratio—0.12:0.24:0.44:1.5, or as 1:2:4:13. As, however, each man is exposed to the annual death rate for his decade for 10 years before he passes into the next decade his risk for each decade must be 10 times the annual risk, and these figures amount to 25; in other words, 1 in 4 doctors die before the age of 65, or it may be more happily stated that 3 out of 4 doctors survive till 65 years of age.

It is true that 41 deaths a year among 8,884 men for 40 years gives a death rate of only 18.4%; but this method of calculating does not take into account that the average age of the 8,884 in 1938 was 41½ years. This average age of 41½ is lower by 3½ years than the mean between 25 and 65 years of age, and the lower years have been shown to have a lower mortality.

What are the causes of early death among doctors? In addition to the year 1938, when there were 41 deaths, I took the year 1939 and up to May, 1940, so as to get 100 consecutive deaths among these 8,884 doctors, omitting those from enemy action. The causes of 89 deaths were obtained; the causes of 11 could not be determined, so I took the next 11 deaths to get a consecutive 100 in which death certificates were available.

Causes of 100 Consecutive Certified Deaths in 8,884 Doctors		J. Amer. med. Ass. 100 Consecutive Death Notices at all Ages	
Cardiovascular degeneration ..	17	..	15 { 8 cardiac 7 arteriosclerosis
Malignancy ..	15	..	5
Pneumonia (pleurisy) ..	12	..	1
Coronary thrombosis ..	10	..	9
Hemiplegia ..	9	..	—
Suicide and misadventure ..	7	..	—
Accidents ..	5	..	2
Pulm. tuberculosis ..	4	..	3
Rt. heart disease ..	3	..	—
Congen. aneurysm ..	2	..	—
Aortic aneurysm ..	1	..	—
Infections :			
Brain ..	2	..	—
Septicaemia ..	2	..	—
Enteric fever ..	2	..	—
Peritonitis ..	2	..	3
Bact. endocarditis ..	2	..	—
Ulcerative colitis ..	1	..	—
Prostate ..	1	..	—
Enemy action ..	1	..	—
Blood diseases ..	1	..	—
Perf. duod. ulcer ..	1	..	—
Cirrhosis of liver ..	—	..	1
Acute gastritis ..	—	..	1
Chr. nephritis ..	—	..	1
Bronchiectasis ..	—	..	—
Unstated ..	—	..	58
	100		100

Causes of Illness among Doctors

What are the causes of morbidity among doctors? Let me first repeat that no account is taken of illnesses of less than 7 days, but all illnesses in which the doctor was unable to do his work for 7 days or over are included. In the year 1938, 1,620 of the 8,884 doctors were ill for over a week,

* The Presidential address to the Medical Society of London.

in many instances for many weeks. Some of them had been ill for months or years; on the other hand, some were only beginning long illnesses. These 1,620 were certified by registered medical practitioners as suffering from the following disabilities:

Respiratory infections ..	351	Insanity ..	11
Influenza ..	276	Colitis ..	11
Accidents ..	100	Malignancy ..	11
I.C.T. skin ..	68	Pleurisy ..	10
Anxiety state ..	60	Auricular fibrillation ..	9
Fibrositis ..	55	Measles ..	9
Appendicitis ..	54	Scarlet fever ..	7
Infections of hand ..	51	Diphtheria ..	7
Special senses ..	49	Prostate ..	7
Peptic ulcer ..	45	Chicken-pox ..	6
C.N.S. ..	33	Ischio-rectal abscess ..	5
Degen. cardiovasc. dis. ..	29	Angina pectoris ..	5
Pyelitis and cystitis ..	27	Glandular fever ..	5
Pneumonia ..	21	Erysipelas ..	3
Pulm. tuberculosis ..	18	Gout ..	3
Renal disease ..	17	Whooping-cough ..	3
Gall-bladder ..	15	Diabetes ..	2
Jaundice ..	13	Hyperthyroidism ..	2
Mumps ..	12	V.D.H. ..	2
Asthma ..	12	Undulant fever ..	2
Coronary thrombosis ..	12	Thyroid disease ..	2
Rh. and osteo-arthritis ..	12	Typhoid ..	1
Acute rheumatism ..	11	Unclassified causes ..	156

These 1,620 doctors were totally incapacitated for 7,040 weeks in the first six months of their illness and 3,942 weeks in the second six months, a total of 10,982 weeks. In other words, 1,620 doctors out of 8,884 were ill and unfit for work for 10,982 weeks in 1938, an average illness rate of 47 days each, while 7,264 doctors did not have a week's illness; the average sickness for the 8,884 was therefore 8.6 days a year. To generalize, every doctor must expect to have an average of 8.6 days of illness every year from the age of 25 to 65.

As a check on these figures and the conclusions drawn I investigated the amount of sickness in 100 consecutive doctors who reached the age of 65. They had been under observation for an average of 30½ years, and had suffered 3,314 weeks' illness—that is, an average of 7.5 days every year from the age of 35 to 65. Those who reach the age of 65 might be acclaimed as slightly tougher than the whole group, which includes those who fall by the wayside and die on the journey, perhaps after a long illness. Seven out of the 100 doctors did not have a week's continuous illness during their working lives.

Coronary Thrombosis

The title of "the doctor's disease" has been given to coronary thrombosis. The reason for this may lie in the last published Decennial Report of the Registrar-General relating to the deaths in England and Wales for 1930, 1931, and 1932. The causes of death were tabulated under 86 groups of occupations, and the report shows that the deaths from angina pectoris or coronary disease among 25,000 physicians and surgeons amounted to 70. This was no less than 368% of the average of all occupations, and was commented on as follows: "Their angina pectoris ratio of 368 was much the highest amongst the 86 occupations, being 64% in excess of the ratio for the remaining occupations in Social Class I and 11½ times as great as that for agricultural labourers."

It must be assumed that deaths from coronary thrombosis were then usually certified as angina pectoris. It was at that time that a new conception of coronary thrombosis had been demonstrated to us by our colleagues in America, and this new and accepted conception was applied to the deaths of doctors before it permeated the certificates of all other social classes. It is to be expected that the Registrar-General's next Decennial Supplement will show a further increase for doctors and a far greater increase in all other classes of workers as this cause of death is substituted for myocardial degeneration. The Registrar-General on page 57 referred to "the still more rapid increase in certification of deaths due to angina pectoris." A fairer comparison may be to take the total of deaths due to "heart diseases," which shows that physicians and surgeons had a mortality 138% of the average of the community. This figure is still high, but it does not bear the enormous significance of over three and a half times the death rate from angina pectoris of the general population. The Registrar-General seems to have taken the same view, for on page 60 the following much-less-quoted statement is found: "It would appear that degenerative disease in the heart affects all classes of males to much the same extent, but whereas amongst men

whose social conditions are most favourable it tends to express itself in forms diagnosed as angina pectoris or coronary disease, at the other end of the scale it tends to take forms described on death certificates as myocardial degeneration."

In the *Proceedings of the Staff Meetings of the Mayo Clinic* for Nov. 5, 1941, p. 714, is an article by F. A. Willius entitled "A Talk on Cardiac Disease among Physicians." He opens his paper thus: "Why do so many physicians die from heart disease?" and goes on, "The cardiac death rate among physicians to-day is appalling. Anyone doubting the authenticity of this statement need only peruse the obituary list of any current number of the *Journal of the American Medical Association* to find death ascribed to heart disease in 30 to 60% of cases in which the cause of death is stated. In the majority of instances coronary disease is the cause of death, and coronary thrombosis is the ranking killer." A fallacy is avoided by the words "in which the cause of death is stated." It is quite possible that when only 42 out of 100 death notices mention the cause of death these may include all the coronary thrombosis deaths. It would appear from my list that 27 out of 100 deaths among doctors before the age of 65 are due to cardiovascular degenerative causes and 9 to cerebral vascular degenerative causes. Even then their death rate is lower than for the male population of England for the same year.

Where is the evidence that any other profession or trade has a lower rate than 27 cardiovascular deaths in 100 deaths before age 65? I cannot find it. I do not think it exists. I do not believe coronary thrombosis is "the doctor's disease." The true position in Great Britain is that 1 doctor in 4 dies before he reaches the age of 65, and 1/10 of 1 in 4, or 1 in 40, dies from coronary thrombosis, and less than 1 in 10 up to 65 years of age dies from all cardiovascular and cerebrovascular degenerations, including coronary thrombosis.

It then appeared to me of interest to analyse the family histories, as known at the age at which a man comes under observation, in those who suffered from coronary thrombosis or pulmonary tuberculosis, and as a control those who reached the age of 65 and were in work at that age. They are set out in the accompanying table.

Family Histories

	Of 37 who died of or developed Coronary Thrombosis	Control Group of 37 at Work at 65	Of 37 who suffered from Pulmonary Tuberculosis
Parent died of vascular hemiplegia ..	6	7	3
" " " heart disease ..	5	5	5
" " " angina ..	2	1	1
" " " pulm. tuberculosis ..	1	0	1
Brother or sister ..	4	3	3
Relative ..	2	0	0
Mean blood pressures : Systolic ..	133	130	130
Diastolic ..	80	86	81
Average weight ..	12 st. 12 lb.	11 st. 5 lb.	11 st. 10 lb.

From these small figures it might be misleading to be at all dogmatic; but in general it may be said that there is no evidence at all here that men who develop coronary thrombosis have had a parentage with a bad family history of early cardio-

vascular disease. The healthiest doctors at the age of 65 have had a similar family history of cardiovascular disease, and much the same may be said of those who develop pulmonary tuberculosis; my inference is that the same experience would be found in the same number of doctors suffering from other diseases. Also, it can be generally stated that the medical men who develop pulmonary tuberculosis between the ages of 30 and 65 have no worse tuberculous family history than the healthiest doctors, nor indeed than those who develop coronary thrombosis. I believe the converse is true: that a family history of tuberculosis is negligible after the age of 30, and even before that age.

Onset of Coronary Thrombosis.—The records were then searched to find at what ages coronary thrombosis occurred, how many died of this illness, how many survived and were unfit to work again, and how long those worked who completed their convalescence.

Ages at Onset				Deaths	Unfit for Work	Returned to Work
35-45	45-55	55-65				
7	19	11		11	8 years, 1 5 " 3 4 " 1 1 " 3	18* Working : 4 years, 2 3 " 6 2 " 2 1 " 4 <1 " 2 Reached 65 2
Approx. No. of Living in Each Group in 100s :						
36	18	11				

* Average duration of unfitness for any work was 18 weeks.

From this it can be said that out of 37 who develop coronary thrombosis 11, or approximately 1/3, die, 8 become ambulatory but unfit for work, whereas 18, or half of them, are working after a year or for a few years. Liability to coronary thrombosis steadily rises with successive years, as one would expect, but only to the age of 45, when a plateau is reached which remains flat to the age of 65.

Onset of Tuberculosis.—At what ages do the 37 who suffered from tuberculosis develop their disease?

Ages at Onset				Deaths	Unfit for Work	Returned to Work
25-35	35-45	45-55	55-65			
16	12	8	1	6	10 (up to 9 years)	21* Working : 23 years, 1 12 " 1 7 " 1 5 " 3 4 " 5 3 " 2 2 " 2 <2 " 3
Approx. No. of Living in Each Group in 100s :						
14	36	19	11			

* Average duration of unfitness for any work was 65 weeks.

Summary

1. The causes of death among doctors before the age of 65 have been stated.
2. The causes and incidence of ill-health among doctors have been tabulated.
3. The title of "the doctor's disease," given to coronary disease, is challenged.
4. It was found that the parental history as regards cardiovascular degeneration was the same for 37 doctors who developed coronary thrombosis as for a control group of 37 doctors who were still working at the age of 65, both these groups having been passed fit at the age of 30.
5. It was also found that the parental history as regards pulmonary tuberculosis was the same for 37 doctors who developed pulmonary tuberculosis as for the control group of 37 doctors who were still working at the age of 65, both these groups having been passed fit at the age of 30.

During the Balkan campaign according to German experience (Weiler: *Dtsch. Militärarz.*, 1941, 11) the principal diseases occurring were dysentery and influenza. Acute influenza was often difficult to distinguish from typhoid. The percentage of cases of bronchopneumonia (41) was high. Half of the cases were treated with sulphonamides and the other half with "novalgin" and quinine. The results were the same in both groups. The author believes that the best results were obtained by intravenous injection of quinine-calcium.

THE CLINICAL SIGNIFICANCE OF THE Rh FACTOR

BY

K. E. BOORMAN B. E. DODD, B.Sc.

AND

P. L. MOLLISON, M.B., M.R.C.P.

(Concluded from p. 538)

Haemolytic Transfusion Reactions Due to Rh Antibodies

As first pointed out by Wiener and Peters, the repeated transfusion of Rh-positive blood to an Rh-negative individual may be followed by a haemolytic reaction due to the production of Rh antibodies as a response to the first or subsequent transfusions. The following case is probably of the mildest type of this reaction.

A Mild Type of Reaction

Case 1.—A man aged 25 had had symptoms of ulcerative colitis for 8 years. In November, 1940, he had a relapse and received two transfusions totalling 2,500 c.cm. of citrated stored blood of group O. These transfusions were followed by clinical improvement, and the patient remained well for many months. He was readmitted to hospital in April, 1942, with a return of symptoms, however, and in view of the success of the previous treatment it was decided to give him a further transfusion. He was found to belong to group O Rh-negative. His serum was tested against a series of group O bloods and found to give no reactions at all at 37° C. or at any other temperature. It was therefore considered safe to proceed with the transfusion of blood from two of these donors. For purposes of record these bloods were also tested with anti-Rh sera and found to be Rh-positive.

1,000 c.cm. of citrated blood from these two donors was given slowly over a period of 5 hours. Following the transfusion the patient had a slight headache and a rise of temperature to 100° F. but no other symptoms, and when seen on the next day expressed himself as feeling better for the transfusion. A venous sample was obtained 48 hours after the transfusion for comparison with the pre-transfusion sample. It was found that only insignificant changes in haematocrit and haemoglobin values had occurred; at the same time it was noted that the serum of the later sample was distinctly yellow, in contrast with that of the pre-transfusion sample, which was pale. A test was made to see whether the Rh-positive blood was surviving in the recipient's circulation by testing a suspension of blood taken from him with a potent anti-Rh serum. Many moderate-sized clumps were found in the suspension, thus indicating the survival of a substantial part of the transfused blood, since a control test with the recipient's blood before transfusion showed no trace of agglutination.

A further sample was obtained upon the fifth day, and it was noted that the serum was even more icteric; a quantitative van den Bergh test showed that it contained 1.5 mg. per 100 c.cm. Examination of the serum with a series of group O bloods revealed the presence of an Rh antibody. A survival test showed that only a small amount of Rh-positive blood was now present in the circulation. On the seventh day after transfusion there was no trace of the donor blood in the recipient's circulation, and the Rh antibody had risen further in titre.

Throughout the period of observation the patient continued to improve slowly, and he left hospital on the eighth day. Blood urea estimations were carried out upon the fifth and seventh days after transfusion; strictly normal values were found.

Reactions in Recently Delivered Women

The frequency with which intra-group haemolytic transfusion reactions occur in women whose infants are affected with erythroblastosis foetalis has been stressed by Levine, Katzin, and Burnham, and corroborated by Wiener. In the present series of investigations 4 such cases have been encountered. Two illustrative cases are here quoted to demonstrate the variation in severity of the reactions.

Case 2.—A woman aged 25: two previous pregnancies. The first was normal throughout, resulting in the birth of a normal baby. The second resulted in a baby which developed jaundice during the first week of life, but subsequently improved without relevant treatment. After delivery the mother was found