

gestation in which the genitalia could be visualised the accuracy of sex determination was 86% to 92.7%.<sup>8,9</sup> In one of the studies the accuracy for male fetuses was 90% and for female fetuses 100%.<sup>8</sup> Experience and technological improvements mean that fetal sex can now be determined as early as 13-14 weeks' gestation (personal communications with radiologists specialising in ultrasound). Thus, if the fetus is detected to be female and the family elects to terminate the pregnancy abortion is performed in the second trimester. Mid-trimester abortions require more aggressive methods than those performed earlier and are associated with increased morbidity and mortality.<sup>10</sup>

Fetal sex determination and medical termination of pregnancy on the basis of fetal sex are illegal in India, and a bill has recently been passed in parliament which strengthens the law. Although stricter enforcement of the appropriate laws may help, only a change in the attitude of society, perhaps accomplished through efforts that raise the social and economic status of women, will decrease the use of fetal sex determination and subsequent female feticide.

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## Stress, anxiety, and depression in hospital consultants, general practitioners, and senior health service managers

Richard P Caplan

### Abstract

**Objective**—To study stress, anxiety, and depression in a group of senior health service staff.

**Design**—Postal survey.

**Subjects**—81 hospital consultants, 322 general practitioners, and 121 senior hospital managers (total 524).

**Main outcome measures**—Scores on the general health questionnaire and the hospital anxiety and depression scale.

**Results**—Sixty five (80%) consultants, 257 (80%) general practitioners, and 67 (56%) managers replied. Of all 389 subjects, 183 (47%) scored positively on the general health questionnaire, indicating high levels of stress. From scores on the hospital anxiety and depression scale only 178 (46%) would be regarded as free from anxiety, with 100 (25%) scoring as borderline cases and 111 (29%) likely to be experiencing clinically measurable symptoms. The findings for depression were also of some concern, especially for general practitioners, with 69 (27%) scoring as borderline or likely to be depressed. General practitioners were more likely to be depressed than managers (69 (27%) v 4 (6%) scored  $\geq 8$  on hospital anxiety and depression scale-D;  $P=0.004$ ) with no significant difference between general practitioners and consultants. General practitioners were significantly more likely to show suicidal thinking than were consultants (36 (14%) v 3 (5%);  $P=0.04$ ) but not managers (9 (13%)). No significant difference could be found between the three groups on any other measure.

**Conclusions**—The levels of stress, anxiety, and depression in senior doctors and managers in the NHS seem to be high and perhaps higher than expected.

### Introduction

Many reports have suggested that stress among doctors is high, but careful searches of the literature show that few studies have measured stress with much

reliability or validity. Most comment on the postulated causes of stress or on specific subgroups of the medical specialties, and few use standardised rating scales. It is rare to find studies that include a control group. The most frequently quoted British study is confined to junior doctors in their preregistration year.<sup>1</sup>

It is difficult to find a study that includes consultants across specialties and that provides much information about their current level of stress. A recent study has measured levels of stress among general practitioners before and after the introduction of the new contract and suggests that stress has risen among this group.<sup>2</sup> Firth found that nearly a third of medical students and half of junior doctors in their preregistration year were suffering from emotional disturbance.<sup>1,3</sup> The BMA has recently published a document on stress within the medical profession,<sup>4</sup> but, although comprehensive, it contains no references or information about measured levels of stress or psychological symptoms in senior hospital doctors.

I set out to measure the current levels of stress among three defined groups who by and large lived and worked in similar geographical and demographical circumstances.

### Subjects and methods

Three discrete groups of senior NHS staff were included in the study. The first group included all 81 hospital consultants working within North Lincolnshire Health Authority in all medical and surgical specialties. The second group included all 322 general practitioners registered with Lincolnshire Family Health Services Association. A third group included all 121 members of a group representing the senior and middle managers of North Lincolnshire Health Authority. This group, although not a control, was included to balance the "medical" variable. The managers' group included the district general manager, his chief officers, and all the key managers in the district.

All those taking part were asked to complete the

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general health questionnaire<sup>2</sup> and the hospital anxiety and depression scale.<sup>6</sup> The general health questionnaire is a widely accepted and reliable method of establishing minor psychiatric disorders among general populations. It has also been validated as a suitable measure of mental health in occupational studies.<sup>7</sup> I used version 28 in this study with a cut off point of 5/6.<sup>8</sup> Five of the seven items in the severe depression subscale of the questionnaire measure aspects of suicidal thinking. Respondents who scored on two or more of these five items were regarded as having notable suicidal thoughts. The hospital anxiety and depression scale is a well validated measure of the symptoms of anxiety and depression and produces two subscales: A for anxiety and D for depression. A score of between 8 and 10 on either of the subscales indicates borderline presence of anxiety or depression, with a score of over 10 indicating that these conditions are likely to be present.

Eleven consultants and 24 managers completed their rating scales while at, but before the presentation of, two meetings on stress in the workplace run by me, but most questionnaires were circulated by post. All the questionnaires for general practitioners were circulated by post.

## Results

Table I shows the results. I found no significant difference between general practitioners and consultants, general practitioners and managers, or consultants and managers on the hospital anxiety and depression scale-A or the general health questionnaire.

TABLE I—Results of questionnaires on stress, anxiety, and depression in senior health service staff

Questionnaire	Consultants (n=65)	General practitioners (n=257)	Managers (n=67)
General health questionnaire-28:			
No (%) with score > 5	30 (46)	122 (48)	31 (46)
Mean (SD) score	5.6 (5.6)	6.5 (6.4)	6.1 (6.2)
Hospital anxiety and depression scale-A:			
No (%) with score ≥ 8	29 (45)	140 (55)	42 (63)
No (%) with score > 10	15 (23)	76 (30)	20 (30)
Mean (SD) score	7.5 (4.0)	8.2 (4.0)	8.7 (3.9)
Hospital anxiety and depression scale-D:			
No (%) with score ≥ 8	12 (19)	69 (27)*	4 (6)*
No (%) with score > 10	3 (5)	28 (11)	0
Mean (SD) score	4.8 (3.1)	5.5 (3.7)	4.1 (2.6)
No (%) with suicidal thoughts	3 (5)†	36 (14)†	9 (13)

\*General practitioners v managers—analysis of variance  $P=0.004$ .

†General practitioners v consultants— $\chi^2$  test,  $P=0.04$ .

There were highly significant differences between general practitioners and managers on the hospital anxiety and depression scale-D (one way ANOVA,  $df=1$ ,  $F=8.5$ ,  $P=0.004$ ) with no significant difference between general practitioners and consultants. Senior medical staff therefore seem considerably more likely to be depressed as a group than do senior managers.

## Health service implications

- Few studies have examined stress and psychological symptoms in senior hospital doctors
- Over half of senior medical staff suffer high levels of stress
- Only 46% of those questioned would be regarded as free from anxiety
- General practitioners were more likely to be depressed and show suicidal thinking than were managers and consultants
- Senior doctors in general suffer more from stress than expected, but this is not restricted to medical staff as managers also suffer. This stress may have far reaching effects on the NHS and patient care.

General practitioners were significantly more likely to show suicidal thinking than consultants (36 (14%) v 3 (5%);  $\chi^2=4.3$ ,  $df=1$ ;  $P=0.04$ , but not managers (9 (13%)). There were no other significant differences between groups.

Correlations were measured with Spearman's correlation coefficients. Table II shows the results, which indicate that the total score on the general health questionnaire correlates positively with scores on the hospital anxiety and depression scale-A and D and suicidal thinking. Scores on the hospital anxiety and depression scale-A correlate positively with scores on the hospital anxiety and depression scale-D and suicidal thinking, with scores on the hospital anxiety and depression scale-D correlating only with suicidal thinking. This is much as one would expect and shows that there is a strong internal consistency within the results. There was no correlation between type of job and any of the measures.

TABLE II—Correlations between measures of anxiety, depression, and stress and job and suicidal thinking in senior health service staff

	Spearman's correlation coefficients ( $r_s$ )			
	General health questionnaire	Hospital anxiety and depression scale-A	Hospital anxiety and depression scale-D	Job
Suicide	0.4345	0.3258	0.3155	0.08
Job	0.0139	0.0935	-0.0567	
Hospital anxiety and depression scale-D	0.6605	0.6131		
Hospital anxiety and depression scale-A	0.6784			

## Discussion

Overall, the main and disturbing findings are that nearly half of the consultants, general practitioners, and managers scored positively on the general health questionnaire (version 28), whereas in the general population only 26.8% would be expected to score positively on the general health questionnaire (version 30) in the East Midlands.<sup>9</sup> A recent major survey of the British population found that the percentage scoring positively on version 30 for those in the professional and managerial group was 27% for men and 28% for women.<sup>10</sup> This version, which although not directly comparable with version 28, shares many questions and a similar modal cut off score for identifying "caseness." Other studies, including those on junior hospital doctors by Firth,<sup>13</sup> used version 12. Banks compared the three versions in the same community population and found high correlations between them with version 28 proving to be the most reliable of the three, showing the highest sensitivity and specificity especially with a cut off point of 5/6.<sup>11</sup> I used version 28 as it allows for more detailed investigation of depression and in particular suicidal thinking. Broad comparisons can probably be drawn between studies by using either version.

There are no normal population values for the hospital anxiety and depression scale-A or the hospital anxiety and depression scale-D, but there are widely accepted cut off values which have been validated in several studies.<sup>12</sup> With these cut off values only 46% of senior doctors and managers would be regarded as free from anxiety, with 25% scoring as borderline cases and 29% likely to be experiencing clinically important symptoms. The findings for depression are also of some concern, especially for general practitioners, with 27% scoring as borderline or definitely likely to be depressed.

The high response rate for senior doctors (80% for consultants and general practitioners) is good for a postal survey. The response rate for managers was

reasonable at 56%. There is a current perception that the medical profession is suffering from increased stress, but most of the attention has been focused on junior doctors and their excessive hours of work. This study shows that senior doctors also suffer from considerable amounts of stress and perhaps more than expected. The inclusion of senior managers in the study, however, has shown that there seems to be an equivalent amount of stress in that group, and this should widen the debate. Stress is not the sole property of the medical profession.

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## Predictive value of continuous ambulatory electrocardiographic monitoring in elderly people

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### Abstract

**Objective**—To determine the predictive value of findings on continuous ambulatory electrocardiographic monitoring in elderly subjects.

**Design**—Retrospective cohort study. Ten year follow up of randomly selected elderly subjects who participated in ambulatory electrocardiography study in 1982. Mortality data derived from official registers.

**Setting**—Turku, Finland.

**Subjects**—480 people aged 65 or older in 1982 who were living in the community, of whom 72% agreed to participate.

**Main outcome measures**—Mortality from cardiac and non-cardiac causes during 10 year follow up.

**Results**—In the univariate analysis adjusted for age, risk of death from cardiac causes was increased among those with ventricular ectopy of more than 100 beats during the day (odds ratio 2.6; 99% confidence interval 1.4 to 6.1) or at night (3.3; 1.1 to 9.8) and in those with multifocal ventricular ectopic beats during the day (2.3; 1.0 to 5.0) or night (3.0; 1.3 to 7.1) compared with those with no ventricular ectopy. Sinusatrial pauses exceeding 1.5 seconds during the day (4.5; 1.8 to 11.1) were also associated with excess mortality from cardiac causes. None of the findings on ambulatory electrocardiography predicted death from non-cardiac causes. A further study of explanatory variables in the stepwise logistic regression analysis showed that sinusatrial pauses exceeding 1.5 seconds (4.0; 95% confidence interval 1.8 to 8.9) and night time multifocal ventricular ectopy (2.7; 1.2 to 5.9) predicted excess mortality from cardiac causes independently of age or clinically evident heart disease.

**Conclusion**—Daytime sinusatrial pauses exceeding 1.5 seconds and night time multifocal ventricular ectopy in the ambulatory electrocardiogram predict increased mortality from cardiac causes independently of clinically evident cardiac diseases in unselected elderly subjects.

### Introduction

The prevalence of various cardiac arrhythmias increases with advancing age. Ventricular ectopy

occurs in 64-100% of apparently healthy elderly people,<sup>1,3</sup> but only 40-50% of young or middle aged people.<sup>4,5</sup> Supraventricular ectopy and atrial fibrillation also increase with age.<sup>3,6</sup> In a population study of elderly people frequent ventricular ectopy on ambulatory electrocardiographic monitoring was associated with clinically evident cardiovascular disease.<sup>6</sup> Sinusatrial pauses also occurred more commonly in subjects with evidence of heart disease.

Frequent and complex ventricular ectopy in patients with ischaemic heart disease<sup>7,8</sup> or previous acute myocardial infarction<sup>9,10</sup> has been found to predict increased mortality from cardiac causes. Reduced variability in heart rate has also been shown to be associated with increased mortality from cardiac causes.<sup>11</sup> Nevertheless, frequent ventricular ectopy in healthy subjects is commonly accepted as a benign phenomenon without prognostic importance.<sup>12,13</sup> Frequent or repetitive ventricular ectopic beats induced by an exercise test did not predict increased morbidity or mortality from cardiac disease during a mean follow up period of 5.6 years in apparently healthy subjects of all ages.<sup>14</sup>

Other studies, however, have reported an adverse outcome in apparently healthy people with frequent ectopy. Hinkle *et al* found that ventricular arrhythmias were associated with sudden death in asymptomatic middle aged men.<sup>15</sup> In a five year follow up study elderly people with more than 10 ventricular ectopic beats an hour had about double the mortality of those with less frequent ectopy.<sup>16</sup> It is difficult to distinguish between physiological and pathological ventricular ectopic activity since ectopy in apparently healthy subjects may be related to underlying silent ischaemic heart disease. This difficulty probably explains the conflicting results in these studies.

Little attention has been focused on the prognostic value of arrhythmias in elderly subjects. Few longitudinal studies with sufficient follow up times exist,<sup>13,16</sup> and it remains unclear whether certain arrhythmias predict poor outcome independently of clinically evident heart disease. We conducted a follow up study to determine the prognostic value of various findings on ambulatory electrocardiographic monitoring in unselected elderly subjects.

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