

# Psychiatric and medical features of near fatal asthma

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## Abstract

**Background** – The associations between psychiatric caseness, denial, and self reported measures of handicap and morbidity due to asthma in patients suffering a near fatal attack of asthma have not been fully explored.

**Methods** – Seventy seven consecutive subjects who presented to Adelaide teaching hospitals with a near fatal attack of asthma were assessed with a validated semi-structured interview following discharge from hospital.

**Results** – 43% of the patients scored  $\geq 5$  on the GHQ-28 questionnaire. There was a positive correlation between GHQ-28 score and limitation to daily activities due to asthma, and between GHQ-28 score and days lost from work, school or usual daily activities, both of which were retained after adjusting for age and sex. Asthma severity did not show a clear association with GHQ-28 score. The asthmatic patients reported high levels of denial, 57% scoring more than 3 out of 5 on the denial scale of the Illness Behaviour Questionnaire. Presentation with a history of progressive respiratory distress was negatively associated with denial score. This persisted after adjustment for age and sex – that is, those with high denial scores were more likely to report presentation as sudden collapse than progressive respiratory distress.

**Conclusions** – Psychiatric caseness (GHQ score  $\geq 5$ ) is associated with high levels of morbidity in asthmatic patients who survive a near fatal attack of asthma. High levels of denial in asthmatic subjects may be life threatening. The link between morbidity associated with asthma and psychiatric features, along with other psychosocial issues, warrants further investigation. A broader paradigm than the traditional medical model should be considered when assessing patients with asthma.

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Keywords: near fatal asthma, psychiatry.

Deaths from asthma increased considerably in Australia in the decade to 1988.<sup>1</sup> Several studies have identified high levels of potentially preventable or avoidable factors associated with asthma mortality<sup>2-5</sup> including deficiencies in professional and self management of asthma.

In addition, we have found that patients suffering a near fatal asthma attack share many similarities with individuals who die from asthma.<sup>6</sup> This provides a research opportunity since information concerning self management and other personal characteristics self reported by cases of near fatal asthma is likely to be more accurate, in many instances, than information reported second hand by near acquaintances of deceased asthmatic patients.<sup>7</sup> Beasley *et al*<sup>8</sup> have also indicated that “studies of near fatal attacks may provide a useful complement to studies of fatal attacks in monitoring the time trends in severe asthma, and in identifying the causes of those changes which occur.”

There is a small but increasing body of research which shows an association between psychosocial characteristics and life threatening asthma. Rea *et al*<sup>5</sup> suggested that both non-compliance with medication and the presence of overt psychosocial problems were risk factors for death from asthma. Yellowlees and Ruffin<sup>9</sup> described high levels of psychiatric disorders, including denial and anxiety, among individuals suffering a near fatal attack of asthma, and hypothesised that excessive denial might be a risk factor for death in asthma. In a review of psychobiological aspects in asthma Yellowlees and Kalucy<sup>10</sup> described a systemic model which suggested possible dynamic interactions of both medical and psychosocial issues in patients with asthma, which might explain many of the differences in levels of morbidity and mortality seen in asthmatic patients. The authors proposed that further research should be undertaken to examine possible associations between psychiatric disorder or psychosocial vulnerability and risk of death in asthma, as well as the effect of psychiatric factors upon the adaptation of patients to, or level of morbidity caused by, asthma.

As part of a larger descriptive study investigating deaths from asthma<sup>6,7</sup> we have examined the levels of psychiatric caseness as measured by the General Health Questionnaire,<sup>11</sup> levels of denial as measured by the denial scale of the Illness Behaviour Questionnaire,<sup>12</sup> and the levels of stigmatisation as measured by the stigma subscale of the Asthma Attitudes and Beliefs Questionnaire<sup>13,14</sup> in a series of patients who presented after a near fatal attack of asthma. The associations between these factors and self reported measures of morbidity due to asthma have been explored in this series of patients.

## Methods

The study was part of a larger study which

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compared deaths from asthma with cases of near fatal asthma attacks presenting to accident and emergency departments of Adelaide metropolitan teaching hospitals. The results of the broader study have been reported elsewhere.<sup>6,7</sup> This study includes the 77 consecutive cases of near fatal asthma attacks aged 15 years and over who presented during the second and third years of the larger study.

The state of South Australia has a population of approximately 1.4 million people of whom over one million reside in the capital city, Adelaide. The study period was from May 1988 to June 1991. During this period cases of near fatal asthma presenting to accident and emergency departments of Adelaide teaching hospitals were recruited. In order to be eligible for entry into the study cases had to have experienced an asthma attack resulting in either respiratory arrest or a  $\text{PaCO}_2$  of  $>50$  mm Hg on arterial blood gas analysis, or be unable to speak at presentation at the accident and emergency department due to severe breathlessness as a result of severe asthma, or both.

An interview questionnaire used in previous surveys of asthma mortality in New Zealand and Victoria was used<sup>23</sup> and a structured approach followed in order to optimise reliability. The questionnaire contained sections on personal details, previous asthma symptoms and management, and circumstances surrounding the near fatal attack of asthma. Additional questions were asked concerning history of personal psychiatric consultation and family history of having previously had a psychiatric consultation. The General Health Questionnaire-28 (a measure of psychiatric caseness),<sup>11</sup> the denial scale from the Illness Behaviour Questionnaire,<sup>12</sup> and the Stigma subscale from the Asthma Attitudes and Beliefs Questionnaire previously published by Sibbald *et al.*<sup>13,14</sup> were also administered. Interviews were conducted following discharge from hospital and generally occurred within 10–12 weeks of the date of admission for the near fatal attack of asthma.

All reported information was reviewed by the assessment panel which made collective judgements concerning the severity of asthma according to criteria established before the study started. Asthma severity in the 12 months before the near fatal attack was classified as mild, moderate or severe based on reported symptoms, frequency of asthma attacks, exercise capacity, medication requirements, and utilisation of medical services, as reported by Robertson *et al.*<sup>2</sup>

#### DATA ANALYSIS

Associations between GHQ-28 scores, denial scores, and features of asthma were investigated using Spearman's correlation coefficient.<sup>15,16</sup> This non-parametric test was chosen because many features did not follow a normal distribution, linearity of relationships could not be assumed, and measurement scales were frequently ordinal. Partial correlation coefficients were calculated to investigate associations after adjustment for age.<sup>17</sup> Because there were some incomplete responses to individual ques-

tionnaire items, the numbers of responses varied for individual items. These numbers are specified with the results. While the level of statistical significance used in this paper equates with a p value of approximately 0.05 or less, it should be noted that, with multiple testing, the actual p value should not be interpreted literally. Rather, the p values should be used only as a guide to potentially non-random associations in this descriptive study.

## Results

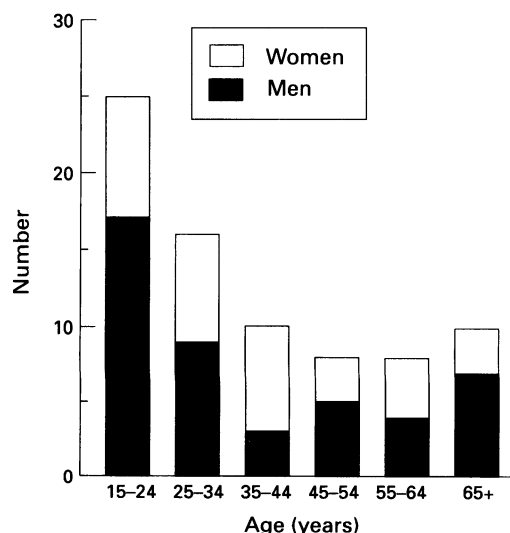
### AGE AND SEX

Persons aged 15 years and over who suffered a near fatal attack of asthma were eligible for entry into the study. Their mean (SE) age was 38.2 (2.2) years. The male:female ratio was 1.41:1, the mean (SE) age of the men being 37.4 (2.3) years compared with 39.3 (2.0) years for the women (figure).

### PSYCHIATRIC FEATURES

The mean score on the GHQ-28 was 5.6, with the proportion scoring 5 or more being 42.9%. The mean score was 4.3 for men and 7.3 for women, the proportion of men scoring 5 or more being 35.6% compared with 53.1% for women. The correlation between age and GHQ-28 score for the 77 subjects was statistically significant ( $r=0.242$ ,  $p<0.05$ ), indicating greater levels of psychiatric caseness amongst older patients. The relation between age and GHQ score retained statistical significance after adjustment for sex ( $r=0.232$ ,  $p<0.05$ ). The relation between sex and GHQ-28 score approached statistical significance ( $r=0.221$ ,  $p>0.05$ ) in the 77 subjects, with women appearing to exhibit greater levels of psychiatric caseness; however, the relation between sex and GHQ score did not retain statistical significance after adjusting for age ( $r=0.210$ ,  $p>0.05$ ).

The mean score for denial was 3.6, with 57% scoring more than 3 out of 5 on the denial scale of the Illness Behaviour Questionnaire.



Distribution by age and sex of 77 cases aged  $\geq 15$  years experiencing near fatal asthma presenting to accident and emergency departments of Adelaide teaching hospitals.

*Asthma features for cases of near fatal asthma attacks (NFA) as assessed from self reports and review panel assessment, and their association with GHQ-28 score and denial score*

Features	Proportion of NFA cases (%)	Correlation with GHQ-28 score*	Correlation with denial score*
<b>Asthma severity (n=74)</b>			
Mild	9.5	$r=0.102$	$r=-0.054$
Moderate	32.4		
Severe	58.1	$p<0.5$	$p>0.5$
<b>Limitation to daily activities due to asthma (n=76)</b>			
None	27.6	$r=0.396$	$r=0.019$
Active sport	35.5		
Climbing stairs	7.9	$p<0.001$	$p>0.5$
Hurrying on the flat	15.8		
Walking on the flat	10.5		
Dressing	2.6		
<b>Frequency of asthma attacks in the month before the event (n=77)</b>			
None	48.1	$r=0.372$	$r=-0.054$
< Weekly	11.7		
≥ Weekly	40.3	$p<0.001$	$p>0.5$
<b>Number of days lost from work, school or usual daily activities in the month before the event (n=77)</b>			
None	63.6	$r=0.396$	$r=-0.160$
1-5	22.1		
6+	14.3	$p<0.001$	$p>0.1$
<b>Presentation as progressive respiratory distress (n=76)</b>			
	84.2	$r=0.221$	$r=-0.239$
		$p=0.05$	$p<0.05$

\*  $r$  = Spearman's rank correlation coefficient.

The mean denial score for men was 3.8 and for women was 3.3. The correlation between age and denial score in the 77 subjects did not approach statistical significance ( $r=0.051$ ,  $p>0.5$ ), nor was there a statistically significant correlation between the GHQ-28 score and denial score ( $r=-0.158$ ,  $p>0.1$ ).

A history of personal psychiatric consultation was obtained for 15 of 76 cases (19.7%), whereas a history of such consultations amongst first degree family members was obtained for five of 74 cases (6.8%). There was no statistically significant association between either the denial score or the GHQ-28 score and past personal or family history of psychiatric consultation ( $p>0.1$ ).

#### STIGMA

For the Stigma subscale 30 of 72 cases (41.7%) scored 11 or more, indicating that they felt heavily stigmatised by their asthma. Feelings of stigma (score on the Stigma subscale) correlated with the GHQ-28 score to a statistically significant degree ( $r=0.272$ ,  $p=0.02$ ). The correlation between denial score and feelings of stigma, however, did not achieve statistical significance ( $r=-0.155$ ,  $p<0.2$ ), nor did the relation between stigma score and either age ( $r=0.068$ ,  $p>0.5$ ) or sex ( $r=0.049$ ,  $p>0.5$ ).

#### CIRCUMSTANCES SURROUNDING THE EVENT

Progressive respiratory distress was the mode of presentation for most cases, although 12 of 76 cases (15.8%) presented as sudden collapse. Presentation reported as progressive respiratory distress correlated with the GHQ-28 score to a statistically significant degree in 76 subjects ( $r=0.221$ ,  $p=0.05$ ) (table), but was not retained after adjustment for age and sex ( $r=0.207$ ,  $p>0.05$ ). Denial scores correlated with presentation as progressive respiratory distress to a statistically significant extent ( $r=-0.239$ ,

$p<0.05$ ) (table) – that is, those who scored higher on denial were less likely to report presentation as progressive respiratory distress and more likely to report presentation as sudden collapse. This relation retained statistical significance following adjustment for age and sex ( $r=-0.244$ ,  $p<0.05$ ).

#### ASTHMA FEATURES

Asthma was assessed as severe for 43 of 74 cases (58.1%), whilst 24 (32.4%) were assessed as having had only moderate asthma, and seven (9.5%) as having had only mild asthma before the near fatal attack of asthma. Asthma severity ratings were not correlated significantly with the score on either the GHQ-28 ( $r=0.102$ ,  $p<0.5$ ) or the denial subscale of the Illness Behaviour Questionnaire ( $r=-0.054$ ,  $p>0.5$ ) (table).

The extent to which asthma interfered with usual daily activities was assessed on a self reported basis in 76 subjects (table). The self reported extent of limitation to daily activities due to asthma correlated with the score on the GHQ-28 to a statistically significant extent ( $r=0.396$ ,  $p<0.001$ ) and also with age ( $r=0.524$ ,  $p<0.001$ ), but not with the denial score ( $r=0.019$ ,  $p>0.5$ ). A statistically significant relation between GHQ score and limitation to daily activities was retained following adjustment for age and sex ( $r=0.327$ ,  $p<0.005$ ).

Asthma attacks were reported to occur more frequently than weekly by 31 (40.3%) of 77 cases in the month before the attack. The self reported frequency of attacks in the month before the near fatal attack of asthma correlated with the score on the GHQ-28 questionnaire ( $r=0.372$ ,  $p=0.001$ ) but not with the denial score ( $r=-0.054$ ,  $p>0.5$ ) (table). Age was also found to correlate with reported frequency of attacks in the month prior to the near fatal attack of asthma ( $r=0.233$ ,  $p<0.05$ ) but not sex ( $r=0.071$ ,  $p>0.5$ ). After adjustment for age and sex the relation between GHQ score and reported frequency of attacks retained statistical significance ( $r=0.331$ ,  $p<0.005$ ).

Similarly, reported days lost from work, school or usual daily activities over the month before the event correlated with the score on the GHQ-28 ( $r=0.396$ ,  $p<0.001$ ) but not with the denial score ( $r=-0.160$ ,  $p>0.1$ ). Overall, 11 (14.3%) of 77 cases reported losing six or more days from work, school or usual daily activities during the month before the near fatal attack of asthma (table). Age alone correlated with reported days lost from work, school or usual daily activities ( $r=0.285$ ,  $p>0.01$ ). The correlation between sex (female gender) and reported days lost from daily activities nearly achieved statistical significance ( $r=0.220$ ,  $p=0.055$ ). After adjustment for age and sex the relation between GHQ score and reported days lost from these activities retained statistical significance ( $r=0.322$ ,  $p=0.005$ ).

#### RESPONSES TO PRIOR ACUTE ASTHMA EPISODES

Thirty eight (52.8%) of 72 cases reported having attended the doctor at least once for asthma

in the month before the near fatal attack of asthma. For nine of the 72 cases the reported frequency of attendance at the doctor for asthma in the month before the event was three or more consultations. The frequency of doctor attendance for asthma in the month before the near fatal attack of asthma was correlated with GHQ-28 score ( $r=0.372$ ,  $p=0.001$ ). Frequency of doctor attendance in the month before the near fatal asthma attack also correlated with age ( $r=0.289$ ,  $p>0.01$ ) but not sex ( $r=0.041$ ,  $p>0.2$ ). After adjustment for age and sex the relation between GHQ score and frequency of doctor attendance for asthma in the month before the near fatal attack of asthma retained statistical significance ( $r=0.309$ ,  $p=0.01$ ). The denial score was not significantly correlated with frequency of attendance ( $r=-0.056$ ,  $p>0.5$ ).

When the number of reported attendances at a hospital accident and emergency department for asthma treatment was considered 17 (22.1%) of 77 cases reported having attended at least once in the previous 12 months and eight (10.7%) of 75 reported having attended at least once in the month before the near fatal attack of asthma. A history of admission to hospital for an asthma-related treatment episode in the 12 months before the near fatal attack of asthma was reported by 25 (34.7%) of 72 cases. A total of 20 (26.3%) of 76 cases reported having ever been admitted to an intensive care unit for an asthma-related treatment episode. Relations between neither GHQ-28 score nor denial score, and either frequency of attendance at accident and emergency departments, hospital admission frequency, or frequency of intensive care unit admission achieved statistical significance ( $p>0.10$ ).

### Discussion

The four main findings emerging from this study were, firstly, that a high proportion of asthmatic subjects who had survived a near fatal attack of asthma had a score of 5 or more on the GHQ-28 questionnaire and could, therefore, be defined as psychiatric cases based on published criteria.<sup>11</sup> Secondly, correlations were seen between the score on the GHQ-28 questionnaire and reported levels of morbidity due to asthma (number of days lost from work, school or usual daily activities due to asthma in the previous 12 months, limitation to daily activities due to asthma, and the frequency of asthma attacks and the number of doctor visits in the month before the event) which retained statistical significance after adjustment for age and sex. Thirdly, the cases with a near fatal attack of asthma reported high levels of denial on the basis of their responses to the denial scale questionnaire from the Illness Behaviour Questionnaire<sup>12</sup> and, finally, the relation between mode of presentation in the near fatal attack of asthma (sudden collapse) and denial score retained statistical significance after adjustment for age and sex. Presentation as progressive respiratory distress was significantly correlated with age, which largely accounted for the ap-

parent relation between GHQ score and mode of presentation as progressive respiratory distress.

This study provides further evidence of high levels of psychiatric morbidity in patients who have survived a near fatal attack of asthma. For the practising clinician this is important as it is clear that attention to psychosocial factors should be a component of management. The measure of psychiatric caseness (GHQ-28 score) was correlated with age and also, to a lesser extent, with sex. After adjustment for sex the relation between GHQ score and age was retained, although there is evidence to suggest that women score more highly on the GHQ-28 questionnaire than men.<sup>11</sup> The cutoff score of 5 on the GHQ-28 questionnaire has previously been justified as a measure of psychiatric caseness in an ambulatory setting.<sup>18</sup> Previous research has identified a high prevalence of psychiatric disorder amongst asthmatic subjects.<sup>9,19</sup> Yellowlees *et al*<sup>19</sup> have shown that the high prevalence of psychiatric morbidity amongst cases who have survived a near fatal attack of asthma is no different from that reported by less severe asthmatic patients and is accounted for largely by a high prevalence of anxiety disorders.

In the present study 42.9% of the patients scored in the psychiatric case range on the GHQ and 19.7% also reported a past history (cumulative prevalence) of personal psychiatric consultation. It should be noted that the lifetime prevalence of all anxiety disorders has been reported to be 15% for a general population<sup>20</sup> whilst the point prevalence of psychiatric disturbance in the general population is between 20% and 25%.<sup>21</sup> Rates of psychiatric disorder amongst hospital inpatients are reported to vary between 20% and 40%.<sup>22</sup>

In a recent study of determinants of referral to a psychiatric consultation service conducted in a general hospital setting the consultation rate was only 2.9% while the prevalence of psychiatric morbidity was estimated to be approximately 30%.<sup>23</sup> A high proportion (19.7%) of the patients in this study had previously undergone psychiatric assessment. This may reflect local acknowledgement of the importance of psychological issues in patients with asthma, a preparedness to refer, and availability of services, as well as an indication of need. Despite this, it is arguable that a higher proportion of patients should have been referred for assessment. At the same time, a recent study indicates that the assessment skills of primary care physicians could be improved; 17.3% of patients attending a primary care doctor scored highly on a psychiatric screening questionnaire but, of these, 73% were not identified as psychiatric cases by the doctor.<sup>24</sup>

The results of this study support the previous observation that levels of denial in asthmatic patients who survive a near fatal attack of asthma are higher than those found amongst less severe asthmatic patients and other groups including general practice patients and a control group of psychiatric patients.<sup>9</sup> A score of more than 3 on the denial scale of the Illness Behaviour Questionnaire can be interpreted as

evidence of significant denial. The interaction of denial, psychiatric disorder, and asthma at both individual and community levels has been discussed by Yellowlees and Kalucy.<sup>10</sup> These authors hypothesise that high levels of denial may mitigate against successful management of potentially life threatening asthma. The present study has shown a negative correlation between the denial score and the self reported frequency of asthma attacks in the month before the event, and that those with a high score on the denial scale were less likely to present as progressive respiratory distress and more likely to present as collapse after sudden onset of asthma. Denial has been conceptualised as a potentially constructive adaptive behaviour in many circumstances which may be helpful in adapting to the experience of chronic disease. In the setting of deteriorating asthma control, however, the presence of high levels of denial may be a barrier to the use of appropriate self management strategies to reduce the severity of the asthma attack.<sup>10</sup> Similarly, the presence of denial may reduce the likelihood of the doctor identifying either underlying psychiatric disorder or deteriorating asthma control.<sup>23</sup>

The GHQ score was correlated with presentation as progressive respiratory distress in the near fatal asthma attack as opposed to presentation as sudden collapse from asthma. However, this relation did not quite retain statistical significance after adjustment for age. Older patients were more likely to be assessed as presenting with progressive respiratory distress than younger patients who were more likely to present as sudden collapse. Whether this difference is truly a function of age as a biological determinant or whether it reflects the fact that older asthmatic patients with higher GHQ scores were more likely to present earlier in the natural history of a near fatal asthma attack than younger patients is not clear from the present study. On the basis of previous work,<sup>9,19</sup> where the predominant psychiatric disorder detected amongst asthmatic patients who suffered a near fatal attack of asthma was shown to be anxiety, one can postulate that those with high levels of underlying psychiatric disorder were possibly more likely to present early in the onset of a severe asthma attack and to report an episode of progressively worsening asthma. Those who have high levels of denial were possibly more likely to deny the seriousness of the exacerbation and to present later with sudden collapse, apparently following an attack of seemingly precipitous onset. While denial, as a psychological defence, may be a useful adaptation at one level to chronic illnesses such as arthritis, it would seem sensible to attempt to modify denial levels to reduce the risk of death in patients who are at high risk of death from asthma. Conversely, increased anxiety may not only be appropriate with worsening asthma but may be life saving.

In a study of patient self care in acute asthma, which used hypothetical asthma attack scenarios, Sibbald reported that patients with the highest morbidity from asthma tended to delay taking appropriate action in the evolving asthma attack,<sup>13,14</sup> and that attitudes toward

asthma were only weakly associated with behaviour. Sibbald identified that 38% of subjects fulfilled the criteria of psychiatric caseness on the GHQ-30 questionnaire and that one in four subjects expressed strong feelings of pessimism and stigma about being asthmatic. We found that 41.7% of cases of near fatal asthma attacks reported feeling stigmatised as a result of having asthma, and that there was also a positive correlation between the score on the Stigma subscale and the score on the GHQ-28, but not with the denial score. Given that both asthma and psychiatric disorder are stigmatised, it is possible that the asthma Stigma subscale is detecting more widespread feelings of stigma than those pertaining purely to asthma.

The present study indicates a relation between measures of morbidity and the presence of underlying psychiatric disorder, but no significant relation between asthma severity and psychiatric disorder. The presence of psychiatric morbidity is associated with measures of the impact of asthma on people's lives, as measured by the self reported extent to which asthma interfered with usual daily activities and reported days lost from work, school or usual daily activities, along with the frequency of doctor consultation for asthma in the month before the asthma attack. There is therefore a need in clinical practice for physicians to have simple means of identifying both the presence of severe symptomatic asthma and the presence of underlying psychiatric disorder (principally anxiety) and high levels of denial. Clarke *et al*<sup>23</sup> have shown that high levels of denial and a strong somatic focus were associated with reduced likelihood of referral for psychiatric consultation in an inpatient setting. They further suggested that denial and a somatic focus in the patient may be reflected in, and perhaps be encouraged by, similar preoccupations in the clinicians who manage them. When examined in this light it is possible that the presence of high levels of denial will act as a barrier to the adoption of important self management strategies by asthmatic patients, and that reported levels of morbidity due to asthma may be related to the presence of psychiatric disorder. Doctors who successfully manage asthmatic patients using a co-management strategy may be quite adept at recognising both of these factors, either consciously or unconsciously. Whether or not this is the case, any attempts to measure global levels of functional disability in patients with asthma must take into account psychiatric factors as symptoms of anxiety, panic, and agoraphobia all impact significantly on the ability of patients to carry out the usual activities of daily living. These psychosocial factors have to be clearly differentiated from physiological barriers to healthy adaptation.

The strength of the relation between the GHQ score and self reported measures of handicap due to asthma (limitation to daily activities and days lost from work, school or usual daily activities, number of doctor attendances), even after adjustment for age and sex, was somewhat surprising. The paradigm of the International Classification of Impairments, Dis-

abilities and Handicaps<sup>25 26</sup> may be the most appropriate conceptual vehicle for the assessment of the impact of a chronic condition such as asthma. The purely biomedical model of illness which is embodied in the International Classification of Disease and, more recently, diagnostic-related groupings ignores the secondary psychosocial impact of disease and the consequent resource implications.

It is evident from the results of this study that greater emphasis should be placed on psychosocial issues in patients who have experienced a near fatal attack of asthma. There is an urgent need to educate doctors about the detection of associated psychiatric disorders and high levels of denial in their asthmatic patients. Studies which carefully elucidate the nature and causes of disability and handicap in asthma are essential, as are further studies including intervention studies to modify denial levels in asthmatic patients with moderate to severe asthma and high levels of denial. More case-control studies are required to explore further the contribution of denial and psychiatric symptomatology to morbidity and risk of death from asthma.

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- 1 Sears MR. Trends in asthma mortality - New Zealand and international experience. In: Ruffin RE, ed. *Asthma mortality: proceedings of the second national asthma epidemiology workshop*. Sydney: Excerpta Medica, 1990:1-3.
- 2 Robertson CF, Rubinfeld AR, Bowes G. Deaths from asthma in Victoria: a twelve month survey. *Med J Aust* 1990;152:511-7.
- 3 Sears MR, Rea HH, Beaglehole R, Gillies AJ, Holst PE,

- O'Donnell TV, et al. Asthma mortality in New Zealand: a two year national study. *NZ Med J* 1985;98:271-5.
- 4 British Thoracic Association. Deaths from asthma in two regions of England. *BMJ* 1982;285:1251-5.
- 5 Rea HH, Scragg R, Jackson R, Beaglehole R, Fenwick J, Sutherland DC. A case-control study of deaths from asthma. *Thorax* 1986;41:833-9.
- 6 Campbell DA, McLennan G, Coates J, Frith PA, Gluyas PA, Latimer KM, et al. A comparison of asthma deaths and near-fatal asthma attacks in South Australia. *Eur Respir J* 1994;7:490-7.
- 7 Campbell DA, McLennan G, Coates JR, Frith PA, Gluyas PA, Latimer KM, et al. Near-fatal asthma attacks: the reliability of descriptive information collected from close acquaintances. *Thorax* 1993;48:1099-104.
- 8 Beasley R, Pearce N, Crane J. Use of near fatal asthma for investigating asthma deaths. *Thorax* 1993;48:1093-4.
- 9 Yellowlees PM, Ruffin RE. Psychological defences and coping styles in patients following a life-threatening attack of asthma. *Chest* 1989;95:1293-303.
- 10 Yellowlees PM, Kalucy R. Psychobiological aspects of asthma and the consequent research implications. *Chest* 1990;97:628-34.
- 11 Goldberg D. Use of the general health questionnaire (GHQ) in clinical work. *BMJ* 1986;293:1188-9.
- 12 Pilowsky I, Spence ND. *Manual for the Illness-Behaviour Questionnaire*. Adelaide: University of Adelaide Press, 1981.
- 13 Sibbald B. Patient self care in acute asthma. *Thorax* 1989;44:97-101.
- 14 Sibbald B, Collier J, D'Souza M. Questionnaire assessment of patients' attitudes and beliefs about asthma. *Family Practice* 1986;3:37-40.
- 15 Altman DG. *Practical statistics for medical research*. London: Chapman and Hall, 1991:295.
- 16 Wilkinson L. *Systat: the system for statistics*. Evanston, Illinois: Systat Inc, 1989:63.
- 17 Wilkinson L. *Systat: the system for statistics*. Evanston, Illinois: Systat Inc, 1989:178.
- 18 Finlay-Jones RA, Burvill PW. The prevalence of minor psychiatric morbidity in the community. *Psychol Med* 1977;7:474-9.
- 19 Yellowlees PM, Haynes S, Potts N, Ruffin RE. Psychiatric morbidity in patients with life-threatening asthma: initial report of a controlled study. *Med J Aust* 1988;149:246-9.
- 20 Robins LN, Helzer JE, Weissman MM, Orvaschel H, Gruenberg E, Burke JD, et al. Lifetime prevalence of specific psychiatric disorders in three sites. *Arch Gen Psychiatry* 1984;41:949-58.
- 21 Hooper EW, Nycz GR, Cleary PD, Regier DA, Goldberg ID. Estimated prevalence of RDC mental disorder in primary medical care. *Int J Mental Health* 1979;8:6-15.
- 22 Goldberg D. The recognition of psychiatric illness by non-psychiatrists. *Aust NZ J Psychiatry* 1984;18:128-33.
- 23 Clarke DM, Minas HI, McKenzie DP. Illness behaviour as a determinant of referral to a psychiatric consultation/liaison service. *Aust NZ J Psychiatry* 1991;25:330-7.
- 24 Chancellor A, Mant A, Andrews G. The general practitioner's identification and management of emotional disorders. *Aust Family Physician* 1977;6:1137-43.
- 25 World Health Organisation. *International classification of impairments, diseases and handicaps: a manual of classification relating to the consequences of disease*. Geneva: WHO, 1977.
- 26 McFarlane AC. The International classification of impairments, disabilities and handicaps: its usefulness in explaining biopsychosocial phenomena. *Aust NZ J Psychiatry* 1988;22:31-42.