Implications of prognostic pessimism in patients with chronic obstructive pulmonary disease (COPD) or asthma admitted to intensive care in the UK within the COPD and asthma outcome study (CAOS): multicentre observational cohort study

Martin J Wildman,[1] Colin Sanderson,[2] Jayne Groves,[3] Barnaby C Reeves,[2] Jon Ayres,[4] David Harrison,[5] Duncan Young,[6] Kathy Rowan[5]

EDITORIAL by Fan and Needham

[1]Northern General Hospital, Sheffield
[2]London School of Hygiene and Tropical Medicine, London
[3]Birmingham Heartlands Hospital, Birmingham
[4]Department of Occupational and Environmental Medicine, Liberty Safe Work Research Centre, Aberdeen
[5]Intensive Care National Audit and Research Centre, London
[6]Adult Intensive Care Unit, John Radcliffe Hospital, Oxford
Correspondence to: M Wildman martin.wildman@sth.nhs.uk

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ABSTRACT

Objective To determine whether clinicians' prognoses in patients with severe acute exacerbations of obstructive lung disease admitted to intensive care match observed outcomes in terms of survival.

Design Prospective cohort study.

Setting 92 intensive care units and three respiratory high dependency units in the United Kingdom.

Participants 832 patients aged 45 years and older with breathlessness, respiratory failure, or change in mental status because of an exacerbation of COPD, asthma, or a combination of the two.

Main outcome measures Outcome predicted by clinicians. Observed survival at 180 days.

Results 517 patients (62%) survived to 180 days. Clinicians' prognoses were pessimistic, with a mean predicted survival of 49% at 180 days. For the fifth of patients with the poorest prognosis according to the clinician, the predicted survival rate was 10% and the actual rate was 40%. Information from a database covering 74% of intensive care units in the UK suggested no material difference between units that participated and those that did not. Patients recruited were similar to those not recruited in the same units.

Conclusions Because decisions on whether to admit patients with COPD or asthma to intensive care for intubation depend on clinicians' prognoses, some patients who might otherwise survive are probably being denied admission because of unwarranted prognostic pessimism.

INTRODUCTION

Each year in the United Kingdom, around 30 000 deaths are associated with chronic obstructive pulmonary disease (COPD).[1] Many patients with exacerbations of COPD benefit from assisted ventilation, but for intubation the patient must be admitted to an intensive care unit. COPD accounts for 3% of such admissions in the UK, with a median stay of 16 days (interquartile range 9-29 days).[2]

Doctors consider prognosis to be of "paramount importance" in deciding which patients should be admitted to intensive care,[3] and admission might be refused.[4] Prognosis, however, can be difficult,[5 6] and in an American study doctors' predictions of survival tended to be pessimistic compared with a prognostic model.[7] If prognoses for patients in the UK with exacerbations of COPD are also unduly pessimistic, some patients with reasonable medium term prognoses might be being denied admission to intensive care for intubation and care.

METHODS

We invited all intensive care units participating in the UK case mix programme[8] and three respiratory high dependency units to take part. Eligible patients were those admitted to participating units for breathlessness, respiratory failure, or change in mental status because of an exacerbation of obstructive lung disease. Patients were excluded if they were aged under 45 years or had had surgery within the past 10 days or had been transferred directly from another hospital to the unit. Data were collected for admissions from March 2002 to September 2003 with follow-up to 180 days after admission to intensive care.

On admission, the admitting doctor was asked to estimate the patient's probability of survival to discharge from intensive care or high dependency, to discharge from hospital, and at 180 days after admission. We determined actual survival to 180 days from the general practitioner and confirmed this through the Office for National Statistics. Data were also collected on prognostic variables.

Analyses were carried out using Stata version 9 (Stata Corp, College Station, Tx).

RESULTS

Of 239 intensive care units in the UK in January 2002, 177 were contributing to the case mix programme. Of these, 92 units participated in our study, together with

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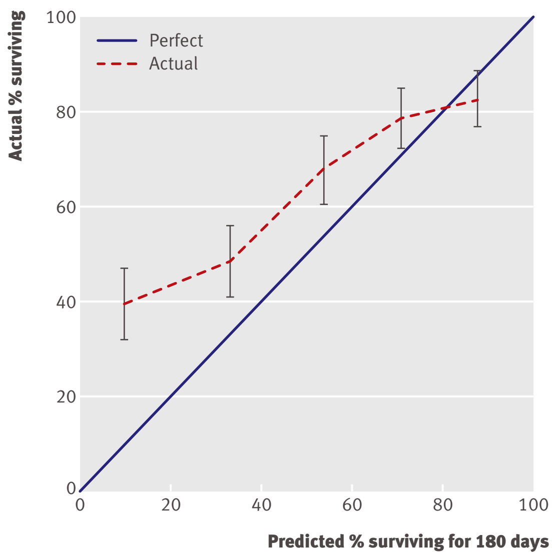

Actual 180 day survival (95% confidence interval) by fifth of predicted survival

the three high dependency units. Data from the case mix programme showed that participating and non-participating units were similar in type, size, affiliation, overall percentage of admissions potentially eligible for the study (3.9 *v* 3.2%), acute physiology scores for COPD,[9] and survival in intensive care for potentially eligible admissions. We recruited 832 patients (724 from intensive care and 108 from high dependency). In intensive care units taking part in the case mix programme there were no differences between the 648 patients recruited to our study and the 996 not recruited in terms of age (z test P=0.49), acute physiology score (z test P=0.96), or survival in intensive care (χ^2 0.77, P=0.38).

Survival rates were 80.9% (95% confidence interval 78.1% to 83.5%) at discharge from intensive care or high dependency, 70.2% (67.0% to 73.3%) at discharge from hospital, and 62.1% (58.7% to 65.4%) at 180 days after admission to intensive care or high dependency. We compared mortality at 180 days predicted by clinicians with the actual 180 day mortality, overall and for different subgroups defined by age, sex, previous function, diagnosis, mean arm circumference, and acute physiology score. We found a tendency towards prognostic pessimism, overall and for most subgroups.

The evidence for prognostic pessimism was weakest in the following subgroups: age ≥75 years, mean arm circumference <25 cm, worst quarter for acute physiology score, and chairbound or bedbound before admission to intensive care or high dependency.

Clinician pessimism was particularly marked for the patients in the lower fifth of the distribution of prognosis (figure). In fact, the tenth of patients with the poorest clinician prognosis had a predicted 180 day survival of around 3% and an actual survival of around 36%.

DISCUSSION

Clinicians are generally pessimistic about the survival prospects of patients with exacerbations of COPD and have particular problems in identifying those with poor prognosis. Patients might therefore be inappropriately excluded from intensive care and the chance of intubation on the basis of a false prediction of futility. The units and patients recruited to this study seem to be representative of UK practice.

Limitations

That we recruited only patients admitted to intensive care or high dependency is a clear limitation. The general level of pessimism among those refused admission, however, was likely to have been even greater than in those admitted. We cannot see how it could have been less. Prognostic pessimism was found across a wide range of subgroups by severity and was also found in a US study that was not limited to patients in critical care.[8]

Historically, access to intensive care in the UK has been problematic and it has not always been possible to admit every patient who might benefit. A culture of pessimism might protect clinicians from the cognitive dissonance involved in being unable to intubate patients they knew to have a reasonable prognosis. When renal dialysis was much less available the discussions around withholding it were often accompanied by predictions of futility if it were to be offered.[10] In the context of triage of patients with COPD, however, this pessimism might be distorting decision making.

WHAT IS ALREADY KNOWN ON THIS TOPIC

Simulation studies in the UK have shown that clinicians are pessimistic in predicting survival after admission to intensive care for patients with chronic obstructive pulmonary disease

WHAT THIS STUDY ADDS

Similar pessimism is observed in clinical practice and has the potential to distort clinical decision making

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Cancer incidence and mortality in relation to body mass index in the Million Women Study: cohort study

Gillian K Reeves, Kirstin Pirie, Valerie Beral, Jane Green, Elizabeth Spencer, Diana Bull, for the Million Women Study Collaboration

EDITORIAL by Calle

Cancer Epidemiology Unit, University of Oxford, Oxford OX3 7LF

Correspondence to: G Reeves gill.reeves@ceu.ox.ac.uk

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ABSTRACT

Objective To examine the relation between body mass index (kg/m²) and cancer incidence and mortality.

Design Prospective cohort study.

Participants 1.2 million UK women recruited into the Million Women Study, aged 50-64 during 1996-2001, and followed up, on average, for 5.4 years for cancer incidence and 7.0 years for cancer mortality.

Main outcome measures Relative risks of incidence and mortality for all cancers, and for 17 specific types of cancer, according to body mass index, adjusted for age, geographical region, socioeconomic status, age at first birth, parity, smoking status, alcohol intake, physical activity, years since menopause, and use of hormone replacement therapy.

Results 45 037 incident cancers and 17 203 deaths from cancer occurred over the follow-up period. Increasing body mass index was associated with an increased incidence of endometrial cancer (trend in relative risk per 10 units=2.89, 95% confidence interval 2.62 to 3.18), adenocarcinoma of the oesophagus (2.38, 1.59 to 3.56), kidney cancer (1.53, 1.27 to 1.84), leukaemia (1.50, 1.23 to 1.83), multiple myeloma (1.31, 1.04 to 1.65), pancreatic cancer (1.24, 1.03 to 1.48), non-Hodgkin's lymphoma (1.17, 1.03 to 1.34), ovarian cancer (1.14, 1.03 to 1.27), all cancers combined (1.12, 1.09 to 1.14), breast cancer in postmenopausal women (1.40, 1.31 to 1.49) and colorectal cancer in premenopausal women (1.61, 1.05 to 2.48). In general, the relation between body mass index and mortality was similar to that for incidence. For colorectal cancer, malignant melanoma, breast cancer, and endometrial cancer, the effect of body mass index on risk differed significantly according to menopausal status.

Conclusions Increasing body mass index is associated with a significant increase in the risk of cancer for 10 out of 17 specific types examined. Among postmenopausal women in the UK, 5% of all cancers (about 6000 annually) are attributable to being overweight or obese. For endometrial cancer and adenocarcinoma of the oesophagus, body mass index represents a major modifiable risk factor; about half of all cases in postmenopausal women are attributable to overweight or obesity.

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INTRODUCTION

Obesity is known to be associated with excess mortality from all causes combined,[1-3] but less is known about its effects on cancer. Although it is widely accepted that body mass index (BMI) is positively associated with cancers of the colon, endometrium, and kidney, adenocarcinoma of the oesophagus, and postmenopausal breast cancer,[4] the magnitudes of such effects and the role of BMI in the development of other, rarer, cancers are less certain. Body mass index may affect not only the development of certain cancers but also the subsequent risk of death.[5] Examining the effect of BMI on both incidence and mortality within the same population is therefore important. We report here on the risk of incident and fatal cancer for a wide range of malignancies according to BMI among women in the Million Women Study, a large cohort study of women in the UK.

METHODS

Data collection, follow-up, and definitions—In 1996-2001 a total of 1.3 million women aged 50-64 who had been invited for screening for breast cancer throughout England and Scotland completed the first study questionnaire. The cohort was resurveyed three years after recruitment. Study participants have been flagged on the National Health Service central registers, so that cancer registrations and deaths are routinely notified to the study investigators. At recruitment, we asked women for their current weight and height to derive body mass index (weight (kg)/height (m)^2), which we categorised as less than 22.5, 22.5-24.9, 25.0-27.4, 27.5-29.9, and 30 or more. We chose the BMI category of 22.5-24.9 as the reference group. We defined women with a BMI of 25-29.9 as "overweight" and women with a BMI of 30 or more as "obese".[6] We examined incidence of and mortality from cancer in relation to BMI for all cancers combined and for 17 of the most common cancer sites or types of cancer.

Statistical analysis—We excluded women diagnosed before recruitment as having cancer, or for whom height, weight, or both were unknown. In analyses of cancer