Length of hospital stay is shorter in South Asian patients with acute pulmonary embolism

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ABSTRACT

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Pulmonary embolism (PE) is a common diagnosis in UK hospitals and confers a significant hospital stay (LOS). There is very little evidence concerning ethnic variations on LOS in patients with PE. We sought to investigate ethnic variations in LOS in a large sample of 3440 patients with PE from 2000 to 2013 across seven hospitals in the north west of UK. We found that South Asian patients have significantly lower LOS compared with Caucasian patients. We discuss possible reasons for, and implications of, this finding.

INTRODUCTION

The annual incidence of diagnosed pulmonary embolism (PE) is estimated between 3 and 4 per 10 000 in the UK, with an estimated mortality rate of up to 60 000 people per year in the UK.¹ In order to provide new knowledge on the management of PE, we aimed to explore the length of hospital stay (LOS) and its predictors in black and ethnic minority patients who presented with acute PE in the north west of England. Our literature search revealed a scarcity of research in this field.

METHODS

We examined LOS and ethnic variations using completely anonymous data of adult patients admitted across seven hospitals across Greater Manchester, North West England, between 2000 and 2013 using ICD-10 coding data. All analyses were performed using SPSS V.20.0. The Caucasian population served as the reference ethnic group. The black and ethnic minority populations were defined as South Asian, Afro-Caribbean, Oriental and mixed race ethnicities. Data on the LOS, age, gender, ethnicity, comorbidities and type of admission were available for all patients. The presence of a comorbidity was defined by the presence of any of the top eight causes of mortality in the UK, namely, ischaemic heart disease, heart failure, cerebrovascular disease, lung cancer, breast cancer, dementia, chronic kidney disease and chronic obstructive airways disease. Such methodology has been previously used by our group and others.^{2 3}



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RESULTS

Within the study period, there were 929 465 patients admitted to hospital. Of these, 3440 (0.37%) were diagnosed with acute PE. Our results showed that there was a higher proportion of women (54%) admitted with PE. Admissions from

the black and ethnic minority population comprised 15.3% of total admissions with PE, and these patients were significantly younger than the Caucasian population (table 1). LOS was also strikingly shorter in the South Asian ethnicity. The shorter LOS of the South Asian ethnicity group compared with the Caucasian group remained significant after modelling by logistic regression analysis accounting for variations in age, gender and comorbidities (table 1).

DISCUSSION

While the reasons for a shorter LOS in the South Asian are not known, there is evidence which suggests that less support is offered to the ethnic minority population at the time of discharge and/or that they may be discharged prematurely and consequently have a greater chance of readmission.⁴ These findings were mirrored by a recent study from Birmingham, UK, which looked at the LOS in patients with diabetes.³ Some prospective studies suggest that early hospital discharge or outpatient-based treatment may be safe in certain low-risk patients.⁵ However, early hospital discharge may prevent rapid detection of potential complications, for example, recurrent PEs or anticoagulant-related bleeding.⁶ There is now evidence from a US study to suggest that patients with a very short LOS have a greater postdischarge mortality rate compared with those who have a more typical LOS.6

While US studies have shown a higher risk of adverse events for ethnic minorities in hospital care, in the UK, ethnic inequalities in patient safety have not been studied on a large scale.⁷ To quantify potential ethnic inequities in hospital care in the National Health Service, prospective cohort studies with solid quality outcomes such as adverse event rate are required. The possibility that the shorter LOS in the South Asian population maybe secondary to inappropriate early discharge warrants further investigation. Conversely, there is also evidence that South Asian and mixed minority populations have a more supportive home environment that facilities earlier discharge.⁷

The data sets used did not allow examination for any association with the presence of specialised chest pain assessment unit, a factor which was previously recognised to predict the LOS for patients with PE.⁸ Our discussion is based upon the assumption that short length of stay corresponds to short inpatient admissions resulting from rapid recovery

Table I Characteristics of admissions for datients with dumonary empty
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Ethnicity	n (%)	Mean age (years)	M:F ratio	Admitted as emergency (%)	With comorbidity (%)	Mean length of stay (days)	OR ratio for length of stay*
All groups	3440 (100.0)	64.1	0.85:1	94.3	40.4	13.3	-
Caucasian	2947 (85.7)	65	0.84:1	94.4	42.1	13.2	1†
South Asian	95 (2.8)	56	1.16:1	91.6	34.7	7.4	0.980 (0.971-0.989)‡
Afro-Caribbean	88 (2.6)	49	0.87:1	88.6	17.0	10.4	0.998 (0.990-1.007)
Oriental	3 (0.1)	42	2:1	100.0	0.0	2.0	0.827 (0.560–1.221)
Mixed	10 (0.3)	45	0.43:1	100.0	20.0	3.6	0.928 (0.815–1.055)
Other	49 (1.4)	56	0.75:1	95.9	30.6	11.4	0.999 (0.988–1.011)
Unknown	248 (7.2)	64	0.88:1	95.6	33.9	18.1	1.006 (1.002–1.010)‡

*Adjusted for age, sex and comorbidity.

†Statistically significant, p<0.05.

‡Caucasian is reference ethnic group.

and hospital discharge. However, the short LOS could instead relate to high inpatient mortality—and therefore the findings presented are limited by the absence of mortality data, an area of future investigation.

We believe that the results of this study and the issues it raises may help design and improve care of inpatients with PE in regions with large multi-ethnic populations.

Correction notice This article has been updated since it was published online. Affiliation 5 has been corrected.

Contributors SS: Literature review, data analysis, manuscript writing. NG: Data analysis, manuscript writing. HU: Data development, analysis, manuscript writing. SC: Data development, manuscript writing. RP: Data development, analysis, manuscript writing, senior author, corresponding author.

Competing interests None.

Ethics approval The study was performed using non-identifiable, completely anonymous data which are outside of the remit of ethical review. Local approval was obtained.

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