

Prevalence of smoking among patients treated in NHS hospitals in England in 2010/11: a national audit

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Abstract

Using data from The Health Improvement Network and Hospital Episode Statistics we investigate smoking prevalence, number of smokers treated, and opportunities for cessation intervention among patients treated in NHS hospitals in England from April 2010 to March 2011. Our results show that approximately 1.1 million smokers are treated in English hospitals each year, receiving a total of 2.6 million episodes of care. These findings suggest that delivering smoking cessation as a routine component of hospital care, as recommended by recent NICE guidance, could achieve marked reductions in the prevalence of smoking and improve the cost-effectiveness of NHS hospitals.

Keywords

Smoking, smoking cessation, secondary care

Introduction

Smoking was responsible for over 460,000 adult admissions to National Health Service (NHS) hospitals in England in the year to March 2012, and treating diseases caused by smoking cost the NHS over £5 billion, about 5% of its annual budget, in the 2005-6 financial year¹. Since smoking is entirely preventable and treatable, many hospital admissions represent an avoidable drain on scarce financial and wider NHS resources.

Treating smoking should be a high priority in the delivery of NHS services, however, the proportion of smokers who receive treatment for smoking from the NHS each year is extremely low and falling². Contrary to Domain 1 of the NHS Outcomes Framework to prevent people dying prematurely, this low engagement with smokers represents a failure by the NHS to treat the biggest avoidable cause of disease, death, and social inequality in health, in the UK. Since delivering smoking cessation interventions in secondary care is highly cost-effective³, it also reflects a failure to manage NHS budgets effectively by prioritising the most cost-effective activities.

Guidance issued by the National Institute for Health and Care Excellence (NICE) in 2013 recommended the routine and systematic delivery of cessation support to all smokers using secondary care services³. However, the prevalence of smoking among those treated in NHS hospitals, and hence the number of people who might benefit, is unknown. This audit was therefore designed to estimate the prevalence of smoking among NHS hospital inpatients in England, the number of smokers treated and the number of potential opportunities for smoking cessation, by treatment speciality in the year 2010-11.

Methods

We identified all patients aged 15 and over who were registered with one of 72 general practices contributing to the Health Improvement Network (THIN) database for the year from 1st April 2010 to 31st March 2011, and used linked Hospital Episode Statistics (HES) data to determine who of

these experienced one or more finished consultant episodes (FCEs) of hospital care. For those with more than one FCE during the study year we selected an episode at random, identified the treatment specialty, and took the admission date of the FCE as the index date on which to assess smoking status. For patients with no FCEs we assigned a random index date during the study year.

Smoking status at the index date (current, ex, never or unknown) was taken to be the most recent recorded in the GP record, up to 27 months before this date, in line with the Quality and Outcomes Framework (QOF) requirement for GPs to ascertain smoking status in all patients aged 15 and over at least once every 27 months. Since the QOF gives practices 90 days in which to record the smoking status of new patients, we excluded any patients who at the index date had less than 90 days of recorded GP data.

We quantified the proportions of current and ex-smokers among patients who did and did not have an FCE during the study period, and among those who did, by clinical specialty of the index FCE. To account for demographic differences between patients treated in each speciality we calculated the relative odds and 95% confidence intervals (CIs) of being a current smoker among those treated in any given speciality and overall, compared to those without an FCE, with adjustment for age and sex.

We used our prevalence estimates and Office for National Statistics mid-2010 national population data to estimate the number of smokers aged 15+ treated as inpatients in 2010/11 in England as a whole. Finally we used data on the number of FCEs in England by speciality⁴ for patients aged 15+ in 2010/11 to estimate the number of FCEs nationally in which the patient was a current or ex-smoker and thereby the number of opportunities for delivering cessation interventions.

Data analysis was carried out using Stata 12 (Stata Corp, College Station, TX). Ethics approval was granted by the THIN Scientific Review Committee (ref. 12-025).

Results

There were 551,320 patients aged 15+ registered in the 72 practices in the study year; we excluded 1,342 patients with less than 90 days' data before their index date. Of those remaining, 80,007 (14.5%) experienced 172,537 FCEs in total delivered over 151,342 inpatient spells. Of patients treated in hospital, 66.9% had just one inpatient spell during the study year, 19.4% had two, and 13.7% had three or more.

A record of smoking status was available for 61.4% of patients without an FCE and 74.4% of patients with one or more. Of patients with no FCE in the study year, 14.7% were current and 19.8% ex-smokers; in those with at least one FCE, these figures were 17.0% and 30.2% respectively. When compared by treatment specialty the prevalence of ever (current or ex) smoking was generally similar across all specialties but highest in those treated for mental illness; however, the prevalence of current smoking was over twice as high in those with mental illness compared to other specialities. The age and sex-adjusted odds of being a current smoker, relative to those not treated in hospital, were increased by a ratio of 1.36 (95% CI 1.33 to 1.39, $p < 0.001$) among those with any FCE but also varied substantially according to treatment specialty (Table 1).

Extrapolation of our prevalence data to the total number of FCEs in England in the study year suggests that approximately 2.6 million episodes of care were delivered to current smokers in 2010-11. There were an estimated 43,318,368 people aged 15+ in England in mid-2010, and extrapolating our estimates that 14.5% of these were treated as a hospital inpatient, and that 17% of patients were smokers, indicates that during the study period approximately 2.6 million episodes of care were delivered to approximately 1.1 million individual smokers.

Table 1: Smoking status by speciality, adjusted ORs relative to patients not treated, and estimated number of national FCEs for patients aged 15+ in England in 2010/11 in current and ex-smokers (ranked by % current smokers)

Speciality	Number of patients in study dataset	% current smokers	% ex smokers	Adjusted OR for current smoking, 95% CI, p value ^a	Total number of FCEs in patients aged 15+ ^b	Number of episodes where patient current smoker ^c	Number of episodes where patient ex-smoker ^d
Not admitted	469,971	14.7	19.8	Baseline			
Admitted	80,007	17.0	30.2	1.36 (1.33-1.39) p<0.001	15,218,526	2,591,869	4,590,267
Adult mental illness	472	51.7	10.6	5.40 (4.50-6.48) p<0.001	121,363	62,739	12,856
Neurology	435	23.2	28.0	1.83 (1.46-2.29) p<0.001	110,457	25,646	30,979
Oral surgery	1,501	22.3	20.7	1.55 (1.37-1.75) p<0.001	185,189	41,208	38,247
Thoracic medicine	1,178	21.9	37.4	2.06 (1.79-2.37) p<0.001	328,631	71,975	122,748
Neurosurgery	514	21.6	28.6	1.71 (1.39-2.12) p<0.001	79,511	17,171	22,740
Pain management	880	21.6	29.3	1.88 (1.60-2.21) p<0.001			
Accident & emergency	3,320	21.5	26.5	1.80 (1.65-1.96) p<0.001	616,188	132,703	163,141
Ear, nose and throat	2,076	21.5	25.3	1.64 (1.47-1.82) p<0.001	255,163	54,818	64,651
Vascular surgery	440	20.5	38.2	1.88 (1.49-2.37) p<0.001			
Upper GI surgery	402	20.4	31.1	1.64 (1.28-2.10) p<0.001			
Gynaecology	5,089	20.1	21.8	1.32 (1.23-1.41) p<0.001	1,023,518	205,548	222,845
Maxillo-facial surgery	718	18.8	24.2	1.40 (1.16-1.70) p<0.001			
General medicine	12,343	18.7	32.8	1.67 (1.59-1.75) p<0.001	2,807,520	523,609	920,752
Obstetrics	4,960	18.6	24.8	0.98 (0.92-1.06) p=0.667	751,316	139,963	186,163
General surgery	9,433	18.3	29.1	1.46 (1.39-1.54) p<0.001	1,704,643	312,449	496,412
Clinical oncology	433	16.9	33.9	1.49 (1.16-1.92) p=0.002	346,188	58,364	117,528
Midwifery	1,803	16.1	23.6	0.81 (0.72-0.92) p=0.001	263,599	42,398	62,281
Gastroenterology	5,182	16.0	32.0	1.31 (1.22-1.41) p<0.001	755,762	120,759	241,809
Plastic surgery	1,713	15.7	28.5	1.20 (1.05-1.37) p=0.006	216,779	34,042	61,883
Urology	4,731	15.1	35.5	1.28 (1.18-1.39) p<0.001	791,324	119,259	281,170
Trauma & orthopaedics	10,170	14.9	28.7	1.18 (1.12-1.25) p<0.001	1,118,975	167,021	320,619
Medical oncology	430	14.9	33.7	1.32 (1.01-1.73) p=0.041	212,779	31,669	71,751
Colorectal surgery	1,122	14.3	33.5	1.16 (0.98-1.37) p=0.088			
Rheumatology	553	14.1	31.6	1.17 (0.92-1.48) p=0.216	147,583	20,816	46,703
Nephrology	405	14.1	38.0	1.21 (0.91-1.60) p=0.189	159,858	22,499	60,786
Breast surgery	475	13.9	25.9	1.09 (0.84-1.41) p=0.533			
Dermatology	944	13.1	32.9	1.14 (0.94-1.38) p=0.178	115,950	15,231	38,200
Cardiology	3,715	13.1	41.3	1.18 (1.07-1.30) p=0.001	571,086	74,556	236,121
Clinical haematology	669	11.7	33.3	0.97 (0.77-1.23) p=0.822	396,215	46,195	132,072
Geriatric medicine	2,044	11.2	35.3	1.10 (0.95-1.26) p=0.197	719,805	80,644	254,256
Ophthalmology	4,586	9.0	39.9	0.85 (0.77-0.94) p=0.002	611,203	55,043	244,161

^a Adjusted for sex and age group (15-19, 20-24, 25-34, 35-49, 50-59, 60+)

^b Data not available for all treatment specialities

^c Calculated as total number of FCEs for speciality x prevalence of current smoking for speciality

^d Calculated as total number of FCEs for speciality x prevalence of ex smoking for speciality

Discussion

This study demonstrates that each year in England around 2.6 million episodes of inpatient care are delivered to approximately 1.1 million smokers. At an individual and population level, intervening to maximise the number of smokers who receive effective NHS support to stop smoking as part of their hospital care represents an opportunity for both health promotion and cost management through a reduction in demand on NHS services. This is particularly true of people treated in mental health settings, among whom current smoking rates are double those in other specialities.

The THIN dataset is broadly representative of the UK population and estimates of the prevalence of current smoking from THIN are comparable to those derived from national survey data⁵, adding credibility to our estimates of the burden of smoking and opportunities for intervention at a national level.

NHS Stop Smoking Services (SSS) provide freely available behavioural support and pharmacotherapy, but these services are predominantly community-based and hence not immediately available to smokers admitted to or discharged from hospital. Separate funding streams for community and hospital services mitigate against service integration, since both services can argue that the other is responsible for inpatient smoking cessation provision. Our own recent trial data demonstrate that treating smoking as a default at the point of admission substantially increases the proportion of smokers accepting support⁶, and this approach is now recommended in NICE guidance³ and the British Thoracic Society's Recommendations for Hospital Smoking Cessation Services⁷. The findings of the present study indicate that default provision of behavioural support and pharmacotherapy to smokers treated as inpatients in English hospitals has the potential to reach 1.1 million smokers each year. NICE data indicate that this approach is cost-effective for both hospitals and wider society³. The routine provision of smoking cessation support to smokers

seen as outpatients, not captured in this study of inpatient data, will further increase the number of smokers reached. Indeed, HES outpatient data indicate 61.5 million outpatient appointments were attended by patients aged 20+ in England in the 2010-11 financial year, approximately four times the number of inpatient FCEs, substantially increasing the number of opportunities to intervene with smokers⁴.

Our finding that around 47% of people treated in hospital are current or ex-smokers, compared with about 35% of those not treated, is broadly consistent with the strong role that smoking plays in causing disease, particularly respiratory and cardiovascular disease. However, the proportion of hospital patients who had quit smoking was also generally high, at around two thirds, and broadly similar between specialties, with the exception of mental illness. Over 60% of people treated for mental illness were ever-smokers and 50% were current smokers. People with mental health problems are more likely to be smokers and to be more heavily addicted, but the extraordinarily high prevalence of continued smoking in this group reflects the previously highlighted failure of existing approaches to engage with this patient group.

Our study thus identifies both the importance, and the magnitude of the opportunity to intervene to treat smokers and reduce the prevalence of smoking in NHS secondary care users. Implementation of current NICE guidance to deliver smoking cessation interventions as a routine component of secondary care provision could have a major impact on the prevalence of smoking, and hence on the morbidity and mortality that smoking causes.

Declarations

Contributors: RH, SA and LS designed the study; YH extracted the THIN and HES data; LS analysed the data; LS, JB and RM wrote the first draft of the manuscript and all authors contributed to and have approved the final version. All authors had full access to all of the data (including

statistical reports and tables) in the study and can take responsibility for the integrity of the data and the accuracy of the data analysis.

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Data sharing: No additional data are available.

Competing interests: All authors have completed the Unified Competing Interest form at www.icmje.org/coi_disclosure.pdf (available on request from the corresponding author). Dr Agrawal reports personal fees and non-financial support from Pfizer, non-financial support from McNeil Pharmaceuticals, personal fees and non-financial support from GlaxoSmithKline, outside the submitted work. Professor Britton chaired the NICE programme development group that published guidance recommending integration of smoking cessation interventions into routine secondary care provision in November 2013, and Dr Murray was a member of this programme development group.

Transparency: The lead author (the manuscript's guarantor) on behalf of all authors affirms that the manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned have been explained.

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