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The prevalence of ear, nose and throat problems in the community: results from a national cross-sectional postal survey in Scotland

Philip C Hannaford, Julie A Simpson, Ann Fiona Bisset, Adrian Davis, William McKerrow and Robert Mills

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Objective. To assess the prevalence of ear, nose and throat (ENT) symptoms experienced by individuals living in Scotland, and their use of GP or hospital services for these problems.

Methods. A cross-sectional postal self-completed questionnaire was sent to a random sample of 12 100 households throughout Scotland. 15 788 individuals aged 14+ years living in the 7244 households who returned the questionnaire (adjusted response rate 64.2%) participated in the study.

Results. Roughly a fifth of respondents reported currently having hearing difficulties, including difficulty following conversations when there is background noise and hearing problems causing worry or upset; few wore a hearing aid regularly. A fifth reported noises in head or ears (tinnitus) lasting more than five minutes. In the previous year, between 13 and 18% of respondents reported persistent nasal symptoms or hayfever, 7% sneezing or voice problems and 31% had at least one episode of severe sore throat or tonsillitis. Nearly 21% of all respondents reported ever having had dizziness in which things seemed to spin around the individual; 29% unsteadiness, light-headedness or feeling faint; 13% dizziness in which the respondent seemed to move. Important gender, age, occupation and deprivation differences existed in the occurrence of these ENT symptoms. There was considerable variation in the proportion of individuals consulting their GP or being referred to hospital for different problems.

Conclusions. ENT problems occur frequently in the community, and most are managed without consulting medical services. Whilst reasonable for many problems, there are likely to be important groups in the community with ENT problems that might benefit from modern interventions.

Keywords. Ear, nose and throat symptoms, epidemiology, prevalence, community survey.

Introduction

Even though ear, nose or throat (ENT) symptoms are common reasons for consulting GPs,[1,2] most individuals manage their problem in the community without seeking help.[3–6] The proportion of symptoms presented, however, varies for different symptoms and may change over time if interventions or access to healthcare services changes. Up-to-date estimates of the prevalence of unreported problems is needed in order to describe their magnitude, and for the planning of services. This paper reports the findings of a large national cross-sectional study of ENT symptoms experienced by residents of Scotland.

Methods

A postal questionnaire was sent to a random sample of 1000 residents in each of the 12 mainland Health Boards of Scotland (with Orkney and Shetland residents included in the Grampian sample) and 100 residents in the Western Isles. Most individuals were identified from the Community Health Index (CHI), a computer file held by each Health Board of residents registered with a GP.[7] Individuals in Lothian, Forth Valley and Greater Glasgow, where the CHI could not be used, were identified using the electoral roll. We meant to send the

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Department of General Practice and Primary Care, Foresterhill Health Centre, Westburn Road, Aberdeen AB25 2AY, UK. Correspondence to Professor Philip Hannaford; Email: p.hannaford@abdn.ac.uk

questionnaire only to individuals aged 14 years or more. By mistake, younger children were included in the sample drawn from the CHI. Thus, 1226 of the 9100 questionnaires in the CHI sample were addressed to young children. Many of these questionnaires were returned completed, albeit at a lower rate than those sent to an older person (49.6% versus 63.6%). Given this level of response, we felt that the cost of replacing the 'child' sample with a correctly identified 'adult' sample was not worth the small likely increase in proportion of questionnaires returned. The results presented here include responses from the 'child' sample.

The questionnaire asked about ENT symptoms experienced by recipient and all other persons in the household aged 14 years or over. If the household contained more than five such persons, information about the five oldest individuals was sought. Most questions related to current or recent (within the previous twelve months) symptoms, although several enquired about lifetime experience of dizziness or unsteadiness. Information about current or recent contacts with GP and hospital services for ENT symptoms was also sought.

The questionnaires were mailed between August and October 1998 with postcards, duplicate questionnaires and reminder letters sent to non-respondents. During the autumn of 1999, 635 of the 677 respondents living in Grampian were asked by letter whether we could look at their GP records for information about ENT symptoms. The remaining 42 respondents could not be approached because: of matching errors on the Grampian CHI; errors made by the person completing the questionnaire; or because the questionnaire was completed by someone other than the addressee. Some 330 participants consented, and a research nurse examined 205 case-notes in order to ascertain how many times each person had been seen in the surgery for upper respiratory tract infections between 1st September 1997 and 31st August 1998. The nurse was blind to each person's questionnaire responses. The notes of the remaining 125 consenting respondents could not be examined because: their records were not available when the nurse visited the practice; the respondent was registered with a small rural practice with only a few respondents (making the costs of reviewing their notes unacceptably high); or because the respondent lived in Orkney or Shetland. The findings from the case-note review were compared with questionnaire responses to ascertain how well patients recalled episodes of sore throat or tonsillitis that resulted in them consulting their GP.

The data were analysed using SPSS for Windows, Version 8 (Chicago, IL: SPSS Inc 1996). Some responses were incomplete, resulting in small variations in the total number available for analysis. Wherever possible, each person was allocated a postcode-based Deprivation Index category using the Carstairs & Morris index.[8] This index uses census data relating to material deprivation to categorise individuals into one of seven (1 being most and 7 least affluent) 'depcat' groups. Responses to a question about the best description for the main occupation throughout the individual's life were grouped into professional or managerial, non-manual or clerical, manual, housewife, student or none. Direct age- and sex-standardized prevalence rates were calculated using health authority mid-1997 estimates published by Office of National Statistics (ONS) as the standard population. When examining the difference between age groups within men and women, the χ^2 squared test for trend was applied. Univariate associations between categorical variables were assessed using the χ^2 test. Multiple logistic regression was used to compare groups after adjustment for age and sex.

The Multi-Centre Research Ethics Committee for Scotland and Local Research Ethics Committees for each Health Board approved the study.

Results

Of the 12 100 questionnaires posted, 822 were returned incomplete because: the person ($n = 212$) or address ($n = 18$) was unknown; the addressee had moved ($n = 545$) or died ($n = 26$); the house had been demolished ($n = 5$); another reason ($n = 16$). Some 7244 questionnaires were completed, giving an adjusted response rate of 64.2% (7244/11 278). The highest adjusted response rate was from households in Grampian (71.5%) and the lowest from those in Lanark (57.4%). The completed questionnaires related to 15 788 individuals (median 2 persons per questionnaire, range 1–5). The age and sex distribution of respondents (Table 1) was

TABLE 1 *Demographic details of respondents to the survey*

	n (%)
Age ($n = 15\,140$)	
14–29 years	3575 (23.6)
30–44	4416 (29.2)
45–59	3736 (24.7)
60–74	2548 (16.8)
75+	865 (5.7)
Sex ($n = 15\,445$)	
Male	7438 (48.2)
Female	8007 (51.8)
Occupation ($n = 15\,198$)	
Professional or managerial	3893 (25.6)
Non-manual or clerical	2038 (13.4)
Manual	4235 (27.9)
Houseperson	2766 (18.2)
Student	1660 (10.9)
None	606 (4.0)
Deprivation Index ($n = 14\,681$)	
1	772 (5.3)
2	2592 (17.7)
3	4126 (28.1)
4	3747 (25.5)
5	1996 (13.6)
6	1120 (7.6)
7	328 (2.2)

similar to that of the whole of Scotland, but there was a small deficit of respondents from the least affluent deprivation category.

Hearing problems and tinnitus

Approximately a fifth of respondents reported currently having hearing difficulties, including difficulty following conversations when there is background noise and hearing problems causing worry or upset (Table 2). Overall 14.0% of men had slight, 4.6% moderate and 2.9% great difficulty following television programmes at a volume acceptable to others without an aid to hearing (data not shown). Corresponding figures for women were 10.8%, 2.9% and 2.0%. Similar results were found for difficulty having a conversation with several people in a group. Of those with hearing difficulties, 77.4% did not usually wear a hearing aid, 10.1% wore one most of the time, 7.7% some of the time and 4.8% none of the time although they had tried one previously. Most individuals (82.5%) obtained their hearing aid free through the NHS. More than half of respondents found loud noises annoying. Nearly a fifth of individuals reported having noises in their head or ears (tinnitus) which usually lasted more than five minutes. At their worst, 55.7% had slight, 17.4% moderate and 7.3% severe annoyance from these problems, with 19.7% denying any annoyance. Most people denied that the tinnitus problems affected their ability to lead a normal life, although 20.9% reported slight, 7.0% moderate and 2.2% severe effect. The prevalence of hearing problems increased significantly ($P < 0.01$) with increasing age among both men and women (Table 2). More older men reported hearing and tinnitus problems than older women, with the opposite pattern in those aged less than 45 years.

Manual workers experienced more hearing difficulties than other occupational groups (Table 3). Thirty-nine percent of manual workers had worked for at least a year in a place that was so noisy that they had to shout to be heard, compared with 16% of professional workers and 10% of non-manual workers. Hearing problems were also more common among individuals in less affluent categories. Approximately a third more individuals in the least affluent group had hearing difficulties compared with those in the most affluent category. Tinnitus was most prevalent among house-persons, manual workers and those in the less affluent categories.

TABLE 2 *Prevalence of different ENT symptoms; overall crude, overall age- and sex-standardized, age-specific prevalence rates in males and females (%)*

	Overall Crude Prevalence % (95% CI)	Overall Adjusted Prevalence %	Males, age					Female, age				
			14–29 %	30–44 %	45–59 %	60–74 %	75+ %	14–29 %	30–44 %	45–59 %	60–74 %	75+ %
Current problem:												
Any difficulty with hearing	18.1 (17.5 to 18.7)	18.3	5.2	11.9	27.2	42.9	56.0*	6.3	9.8	18.5	22.0	40.6*
Very difficult to follow conversation if background noisy	20.9 (20.3 to 21.5)	21.1	7.2	14.1	28.4	44.4	60.9*	9.4	14.2	21.6	25.7	43.4*
Hearing difficulties worrying upsetting or annoying	20.1 (19.5 to 20.7)	20.4	6.4	13.6	28.1	40.5	54.2*	7.9	13.9	23.1	25.4	44.5*
Very loud sounds annoying	55.8 (55.0 to 56.6)	55.4	29.7	46.7	61.5	66.7	64.1*	43.5	61.2	70.4	68.9	69.5*
Tinnitus	17.0 (16.4 to 17.6)	17.1	7.1	12.2	18.2	28.1	34.1*	13.3	16.4	18.1	23.6	25.7*
Problem in last 12 months:												
Blocked nose[a]	13.5 (13.0 to 14.0)	12.9	16.5	12.8	12.1	9.4	9.4*	18.5	16.8	13.7	8.3	6.7*
Runny nose[a]	15.3 (14.7 to 15.9)	15.4	15.0	12.2	12.3	11.9	17.0	19.7	19.3	18.1	12.9	12.3*
Sneezing (at least 6 together)[a]	6.3 (5.9 to 6.7)	6.4	6.0	5.8	4.8	6.2	9.6	8.6	8.0	4.0	5.0	8.6*
Hayfever	18.1 (17.5 to 18.7)	18.2	25.7	20.2	12.2	8.8	8.9*	27.7	24.3	15.1	9.5	6.8*
Voice problem[a]:												
Croakiness	6.8 (6.4 to 7.2)	7.4	4.8	3.8	5.0	5.5	8.5*	9.6	8.9	9.2	6.0	8.8*
Loss or weakness	6.4 (6.0 to 6.8)	6.4	3.4	3.2	4.3	4.8	9.5*	9.3	9.9	8.2	5.6	9.1*
Severe sore throat / tonsillitis	30.6 (29.9 to 31.3)	30.8	36.0	31.7	23.8	14.4	8.2*	50.8	43.2	29.1	17.0	9.5*
Problem ever:												
Dizziness in which things spin around	20.5 (19.9 to 21.1)	20.7	10.8	11.9	15.9	19.7	27.1*	23.7	25.7	28.5	26.0	31.3*
Unsteadiness, light-headedness or feeling faint	28.8 (28.1 to 29.5)	29.1	17.5	18.4	22.2	25.7	35.6*	36.7	39.6	36.6	30.5	38.0
Dizziness in which respondent seems to move	13.3 (12.8 to 13.8)	13.4	7.7	8.0	10.3	11.8	16.3*	15.7	19.3	17.6	13.6	17.6

[a] Every day for more than 14 days.
* $P < 0.01$, significant linear trend.

TABLE 3 *Prevalence of different ENT symptoms; age- and sex-standardised prevalence rates in different occupational and deprivation index categories*

	Occupation						Deprivation index (Carstairs & Morris)						
	Professional %	Non-manual %	Manual %	House-person %	Student %	None %	1 %	2 %	3 %	4 %	5 %	6 %	7 %
Current problem:													
Any difficulty with hearing	16.1	15.0	22.3	16.9	8.5	19.2	15.7*	18.5	17.4	18.2	19.6	19.2	21.3
Very difficult to follow conversation if background noisy	17.6	18.2	24.5	20.3	15.2	26.8	19.0*	19.9	21.1	21.2	22.4	21.5	24.5
Hearing difficulties worrying, upsetting or annoying	18.9	17.5	24.0	19.8	9.2	21.9	18.6*	19.2*	19.4*	20.7	22.4	22.2	22.6
Very loud sounds annoying	59.2	57.4	55.9	52.0	43.7	48.4	55.6	55.4	55.7	54.8	56.2	54.2	54.4
Tinnitus	15.0	15.7	20.1	21.1	11.0	18.6	13.9*	16.1	15.3	18.0	18.8	20.8	19.3
Problem in last 12 months:													
Blocked nose[a]	14.2	13.3	14.1	14.0	11.0	13.1	13.2	14.8	12.4	13.2	14.0	12.8	13.7
Runny nose[a]	17.1	15.6	15.3	14.2	14.7	14.1	14.7	17.6*	14.7	15.4	15.5	12.8	12.7
Sneezing (at least 6 together)[a]	7.8	6.8	6.3	9.3	4.0	6.1	6.2	6.5	5.6	7.1*	6.3	6.7	4.1
Hayfever	20.4	19.3	16.5	15.3	29.6	18.2	17.0	20.4*	18.9	17.7	18.3	14.6	14.5
Voice problem[a]													
Croakiness	8.0	5.6	6.9	8.4	5.5	8.4	5.5	7.1	6.5	6.4	8.3	7.3	8.5
Loss or weakness	6.8	5.9	7.0	10.3	8.2	7.4	6.4	6.8	6.0	5.7	8.2	6.6	8.1
Severe sore throat/tonsillitis	31.7	29.9	29.9	26.7	29.1	27.5	33.5	32.6	31.3	30.0	30.6	29.2	26.8
Problem ever:													
Dizziness in which things spin around	20.3	19.4	23.8	28.1	18.5	23.7	18.0*	20.0*	18.9*	21.3*	24.2	22.8	27.4
Unsteadiness, light-headedness or feeling faint	29.7	29.1	31.0	38.5	24.9	30.8	27.3	29.6	28.5	28.8	31.7	29.2	31.2
Dizziness in which respondent seems to move	11.3	13.6	16.0	24.0	5.9	17.0	10.2*	11.5*	12.7*	13.6*	16.5	15.7	16.4

[a] Every day for more than 14 days.
* Significantly different from deprivation index 7 after adjustment for age & sex, $P < 0.05$.

Nasal symptoms, voice problems and sore throat

Between 13% and 18% of respondents reported having a blocked or runny nose every day for more than 14 days, or hayfever, in the previous twelve months (Table 2). Fewer respondents reported persistent sneezing or voice problems. Nearly a third of individuals had experienced at least one episode of severe sore throat or tonsillitis in the previous twelve months. Significant negative trends with age were observed for the one-year prevalence of persistent blocked nose, hayfever, severe sore throat or tonsillitis. This pattern was seen in both sexes, although the rate of decline was steeper among women than men. Less consistent patterns were observed for other nasal or voice symptoms. For instance, the one-year prevalence of persistent runny nose declined among women with age but not among men.

Students had the highest one-year prevalence of hayfever (Table 3). House-persons had the highest rates of persistent sneezing and voice problems. More affluent individuals tended to have a higher prevalence of persistent runny nose and hayfever than those less well off.

Balance problems

Nearly 21% of respondents had experienced dizziness in which things seemed to spin around the individual; 29% had experienced unsteadiness, light-headedness or feeling faint; and 13% dizziness in which the respondent seemed to move (Table 2). Dizziness or unsteadiness had stopped 15.2% of those experiencing this symptom from performing normal activities for one or more days but less than one week; 3.9% for one or more weeks but less than one month; and 2.8% for one or more months. The symptoms were slightly annoying to 44.3% of those with the problem, moderately annoying to 10.8%, severely annoying to 4.9% and not at all annoying to the rest. Each balance problem increased with age in men. In women, a positive trend with age existed for dizziness in which things spin round but not for other balance symptoms.

House-persons had the highest rates of ever experiencing dizziness or unsteadiness (Table 3). Significantly higher rates of both types of dizziness were observed among individuals in the less affluent groups, but not unsteadiness.

Healthcare utilization

The proportion of individuals experiencing different ENT symptoms in the community who consulted their GP or been referred to hospital in the previous 12 months varied considerably (Table 4). For example, 38% of individuals reporting severe sore throat or tonsillitis in the previous twelve months consulted their

TABLE 4 *Proportion of respondents with selected ENT symptoms who visited their GP or who was referred to hospital in the previous 12 months*

Problem with:	Number reporting the symptom	Visited GP *n* (%)	Referred to hospital *n* (%)
Hearing	2731	628 (23.0)	379 (13.9)
Tinnitus	2569	454 (17.7)	149 (5.8)
Nose	4868	808 (16.6)	164 (3.4)
Voice	1358	257 (18.9)	68 (5.0)
Tonsillitis or severe sore throat	4646	1782 (38.4)	98 (2.1)
Balance, dizziness or unsteadiness	4793	1104 (23.0)	191 (4.0)

GP at least once. On the other hand, only about 17% of individuals with either tinnitus or persistent nasal problems consulted their GP. For most symptoms, less than 6% of patients were referred to hospital. However, about 14% of patients with hearing difficulties reported being referred to hospital in the previous twelve months.

Case note review

Eighteen of the 38 respondents who reported in the questionnaire visiting their GP in the previous twelve months because of sore throat or tonsillitis had an episode of tonsillitis or sore throat documented in their notes. Eight individuals had a diagnosis of an episode of tonsillitis or sore throat not reported on the questionnaire. Of the 20 individuals who reported visiting their GP because of sore throat or tonsillitis without corroborative evidence in their GP records, 16 had another ENT-related condition recorded (pharyngitis, laryngitis, upper respiratory infections, common cold, or ENT symptoms).

Discussion

Summary of the main findings

This large community-based survey observed a high prevalence of ENT symptoms among residents of Scotland, often with considerable variation between age, gender, occupation and socio-economic groups. Most symptoms occurred without presentation to GP services.

Strengths and limitations of this study

The survey had a good response rate and included a wide variety of ENT symptoms, age, occupation and socio-economic groupings. The case note review suggests that the patient reported data were reasonably accurate, at least with respect to the commonest reported ENT problem, sore throat or tonsillitis. Others have found that simple questions about hearing provide reasonable estimates of hearing loss prevalence in older populations.[9] The population-based approach enabled us to determine the proportion of different symptoms presenting to GPs. However, we did not collect information about the severity of symptoms, their effect on quality of life, or use of alternative sources of health care, such as pharmacy, complementary medicine, lay-treatments, and telephone advice. This information is needed for a fuller understanding of patterns of help-seeking behaviour.

We asked recipients to complete their part of the questionnaire before handing it to others in the household older than 13 years. Most reported doing this although perhaps a third of individuals had the questionnaire completed on their behalf, usually by a female relative. Those completing the questionnaire on behalf of others may have misreported the symptoms of the third party. Our results could also have been affected by the inadvertent sending of questionnaires to children identified from the CHI, if childless households responded differently from those with children.

We do not know the characteristics of non-respondents, particularly their ENT health status. However, the similar age and sex distribution of respondents to national data indicates that a representative sample of the Scottish population was surveyed. If non-respondents had fewer symptoms than respondents, our prevalence rates will have been overestimated. The cross-sectional nature of the study prevents us from making any causal inferences about observed associations. For example, we cannot tell whether the higher prevalence of dizziness among house-persons is due to individuals finding their symptoms so disabling that they are unable to work. Furthermore, our desire to keep the questionnaire reasonably short meant that data about other potential confounding factors (such as smoking, exposure to allergens, occupational hazards etc) were not collected. We cannot determine, therefore, whether the higher prevalence of hearing difficulties among the manual workers reflects increased exposure to harmful working conditions such as noisy machinery. With large datasets such as ours, statistically significant associations can emerge which are not clinically relevant.

Other studies

Comparatively few community-based studies have looked at the range of ENT symptoms included in our survey. A study conducted in the 1980s in different parts of the UK found that about 10% of the adult population had hearing difficulties in a quiet environment.[10] The prevalence of hearing loss among men aged 75+ years

in our study was a little higher than that found in a large multicentred Medical Research Council (MRC) Trial of Assessment and Management of Older People in the Community (56% versus 45%), but almost identical in similarly aged women (41% versus 40%).[11] Other community-based studies in North America,[9] Italy,[12] Denmark[13,14] and Sweden[15] have found high levels of hearing problems, especially among older people, and in manual workers or those exposed to occupational noise. Like the MRC Trial,[11] few respondents in our study with hearing loss wore a hearing aid regularly, even though these devices have demonstrable important quality of life benefits.[16]

In an international longitudinal study of more than 11 000 individuals aged 20–44 years from 14 countries in Europe and America, the self-reported prevalence of nasal allergies including hayfever in a second set of surveys conducted between 1998 and 2003 was 25%, with no evidence of heterogeneity between countries.[17] This figure is broadly consistent with our results for hayfever. In the international study, the prevalence of nasal allergies had increased by 4% from that found in the baseline survey completed 5 to 11 years earlier, a change that was independent of gender but which was greater in the youngest age group studied (20–24 year olds). Another study conducted in Nottingham, UK, which used the same questions as our survey, found higher levels of nasal symptoms (e.g. persistent nasal obstruction 16.9% versus 12.9% observed in our study, persistent runny nose 19.8% versus 15.4%, persistent sneezing 7.1% versus 6.4%, and hayfever 19.6% versus 18.2%).[18] In the Nottingham study, 18% of respondents had visited their GP in the previous two years for hayfever, compared with the 17% of respondents in our study visiting their GP for nasal problems.

A study of 18–64 year-olds registered with four practices in London, UK, reported a 23% one-month prevalence of dizziness, nearly half of which was associated with some handicap.[19] Forty percent of respondents had consulted their GP because of the dizziness.[19] Our study, which included older adults, found a slightly higher lifetime prevalence of dizziness or unsteadiness of 30%. Dizziness was more common in women in the London study, a similar pattern to that found in our survey. Other UK population-based studies in the elderly have found a high prevalence of dizziness[20] or postural disturbances.[21] In a study of 13 000 adults older than 18 years living in five communities in North America, participants had a lifetime prevalence of dizziness of roughly 23%, with higher figures in women and older individuals.[22]

Implications of our study

Our study provides an important reminder that most individuals manage ENT problems themselves without consulting their GP. For many problems, this is probably appropriate since many ENT problems are relatively mild, self-limiting, and benefit little (if at all) from medical intervention. On the other hand, some problems (such as hearing difficulties) can be longstanding with major adverse consequences for both the person with the problem and those living with them. Furthermore, apparently minor ENT symptoms occasionally may be early manifestations of more serious disease. For example tinnitus can be a symptom of acoustic 8th nerve neurilemmoma or meningioma. A major challenge facing primary care remains the need for approaches that support self-management of minor ENT problems whilst simultaneously encouraging-use of services by those likely to benefit from effective treatments such as amplification.

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Declaration

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Conflicts of interest: none.

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