Abstract

Objective. Inflammatory back pain (IBP) is the earliest and most common symptom of axial SpA. However, there is very little information about the prevalence of IBP in the UK. In this cross-sectional cohort study we examined the prevalence of IBP in a UK primary care population using three published IBP criteria.

Methods. Potential participants aged 18–80 years were identified from the records of a large general practice in Norfolk, UK, with 17 177 patients. Read codes were used to identify those who had consulted their general practitioner on at least one occasion with back pain. A self-completed screening questionnaire was sent to a sample of 978 patients, enquiring about symptoms of IBP and extra-spinal manifestations of SpA. Questionnaire responses were used to determine whether patients met the Assessment of SpondyloArthritis international Society (ASAS), Calin and Berlin IBP criteria.

Results. Five hundred and five completed questionnaires were returned (response rate 51.6%). The median age of respondents was 60 years (interquartile range (IQR) 48–67) and 44.8% were male. The minimum prevalence of IBP among patients with at least one previous consultation for back pain was 7.7% (95% CI 6.2, 9.5) using the ASAS criteria, 13.5% (11.5, 15.8) using the Calin criteria and 15.4% (13.3, 17.8) using the Berlin criteria. There was no significant difference in prevalence between men and women, and between different age groups. Extrapolated to the practice population as a whole, the minimum prevalence of IBP in a UK primary care population is 1.7–3.4%.

Conclusion. The prevalence of IBP varies significantly depending on the criteria used for classification.

Key words: inflammatory back pain, ankylosing spondylitis, spondyloarthropathy, prevalence, cohort, classification.

Introduction

Axial SpA can be difficult to diagnose, especially in the early stages—the onset is insidious, there is no specific diagnostic test and suspicion may be low when chronic low back pain is such a common presentation in primary care. Annually approximately one-third of adults in the UK complain of low back pain [1], yet awareness of SpA symptoms among general practitioners (GPs) is not high [2]. As a consequence, diagnostic delay remains a problem in SpA, typically 8–11 years [3, 4], and patients may be denied effective timely treatment.

Inflammatory back pain (IBP) is the earliest and most common symptom of SpA [5]. Targeting investigations such as MRI scanning at patients with IBP may offer a cost-efficient way of reducing diagnostic delays. However, information about the prevalence of IBP in the UK is limited. There have been no published studies in the UK examining IBP prevalence in the general population, and very few in the international literature, particularly using recognized criteria. Yet accurate prevalence data are important for healthcare planning, and it is difficult to interpret diagnostic tests intelligently when the pre-test probability of a condition is uncertain. To address this knowledge gap we determined the prevalence of IBP in a UK primary care population using three published IBP criteria.
criteria: Calin [6], Berlin [7] and the Assessment of SpondyloArthritis international Society (ASAS) [8].

Methods

Ethics approval for the study was obtained from the Norfolk Research Ethics Committee.

Patients

Potential participants were identified from the electronic records of a large general practice in Norfolk, UK. The practice had 17,177 registered patients at the time of the study and serves a mixture of suburban and rural communities. The great majority of the practice population (Pop) is White British in ethnic origin. Read codes were used to find patients aged 18–80 years who had a diagnosis of AS or axial SpA or who had consulted a GP on at least one occasion with back pain. Patients were excluded if they were living in a nursing home or had a terminal illness. From the pool of potential participants, 978 patients were selected at random and invited by letter to complete and return a short questionnaire enquiring about symptoms of IBP. Non-responders were sent a reminder after 2 months. The questionnaire was previously validated in patients with AS, non-radiographic axial SpA and mechanical low back pain [9]. Questionnaire responses were used to determine whether participants met the IBP criteria outlined in Table 1.

Statistics and sample size

Results were analysed with Microsoft Excel and PASW 18 (IBM, Armonk, NY, USA).

The study was designed to examine the prevalence of SpA in primary care. A decision was made to recruit patients with back pain rather than the whole practice population, to reduce the number of patients involved in the study. Assuming the prevalence of SpA is 3–7% among patients with chronic back pain vs 0.4–0.8% in the general population, with a confidence level of 95%, the sample size required decreases from 5728 to 457. Anticipating a 50% response rate, we aimed to invite at least 914 participants.

Results

A total of 505 completed questionnaires were returned (response rate 51.6%). A further seven patients returned blank questionnaires and 18 patients otherwise declined to participate. The median age of the respondents was 60 years [interquartile range (IQR) 48–67] and 44.8% were male. Respondents were significantly older than all potential participants [mean age 57.5 years (95% CI 56.4, 58.6) vs 53.2 years (95% CI 52.2, 54.1)], but there was no gender difference (χ² P = 0.27). There was a significant decrease in the proportion of patients reporting chronic back pain between the first and second mailings (84.2% to 74.1%, χ² P = 0.007). In contrast, the proportion meeting ASAS IBP criteria did not change significantly (19.2% to 18.5%, χ² P = 0.852). Although patients were selected on the basis of a single consultation, 80% reported back pain lasting at least 3 months.

The numbers fulfilling individual IBP criteria in each age band are given in Table 2. Of those who responded to the questionnaire, 75 (14.9%) fulfilled the ASAS criteria, 132 (26.1%) the Calin criteria and 151 (29.9%) the Berlin criteria. Agreement between the three criteria for the presence of IBP was at least moderate, with the best agreement between the Calin and ASAS criteria [85.6%, κ = 0.64 (95% CI 0.56, 0.72)]. IBP was seen more commonly in women, but this difference was not statistically significant. Similarly there was no significant difference in IBP prevalence between different age bands. However, respondents meeting ASAS IBP criteria were significantly younger than those who did not [mean age 51.7 years (95% CI 48.9, 54.4) vs 57.8 years (95% CI 56.4, 59.2)].

The minimum prevalence of IBP among patients with at least one previous consultation for back pain was 7.7% (95% CI 6.2, 9.5) using the ASAS criteria, 13.5% (95% CI 11.5, 15.8) using the Calin criteria and 15.4% (95% CI 13.3, 17.8) using the Berlin criteria.

The initial search identified >3000 patients >18 years who had consulted their GP on at least one occasion with back pain. With a total adult population of 13,387, this gives a conservative proportion of 22.4% who have ever consulted with back pain. Extrapolating the results to the practice population as a whole, the minimum prevalence of IBP in the primary care population aged 18–80 years is

Table 1 IBP criteria

<table>
<thead>
<tr>
<th>ASAS</th>
<th>Calin</th>
<th>Berlin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at onset &lt;40 years</td>
<td>Age at onset &lt;40 years</td>
<td>Morning stiffness &gt;30 min</td>
</tr>
<tr>
<td>Insidious onset</td>
<td>Back pain &gt;3 months</td>
<td>Improvement with exercise but not with rest</td>
</tr>
<tr>
<td>Improvement with exercise</td>
<td>Insidious onset</td>
<td>Awakening at second half of the night because of back pain</td>
</tr>
<tr>
<td>No improvement with rest</td>
<td>Associated with morning stiffness</td>
<td>Alternating buttock pain</td>
</tr>
<tr>
<td>Pain at night (with improvement on getting up)</td>
<td>Improvement with exercise</td>
<td></td>
</tr>
<tr>
<td>Criteria fulfilled if at least four of five parameters are present</td>
<td>Criteria fulfilled if at least four of five parameters are present</td>
<td>Criteria fulfilled if at least two of four parameters are present</td>
</tr>
</tbody>
</table>
1.7% using ASAS criteria, 3.0% using Calin criteria and 3.4% using Berlin criteria.

Discussion

These are the first estimates of IBP prevalence in primary care in the UK, with a minimum prevalence in the adult population of ~3% by Calin criteria.

The prevalence of IBP in our study varied significantly depending on the criteria chosen, with the prevalence according to the Berlin criteria being twice that of the ASAS criteria. This may relate to the way in which the individual criteria were developed. The Calin criteria date from 1977 and were derived from a study of symptoms in 42 AS patients (meeting New York criteria) and 96 controls. No demographic information on participants was given. The Berlin criteria, nearly 30 years later, were an attempt to refine the application of clinical history in established AS. The presence of IBP (with or without HLA-B27 or sacroiliitis on imaging) has been proposed as a screening method for axial SpA in primary care [13, 14] merit referral to a rheumatologist. Using the most conservative prevalence estimate of 1.7%, and the 2011 census data from the Office of National Statistics, there are likely to be at least 700 000 adults in England and Wales aged 18–80 years with IBP. Although questions remain about the likelihood of AS/axial SpA in an individual with IBP, investigating and managing these patients (even to rule out disease) could have considerable cost implications.

Another limitation of our study is that the prevalence in the general population may be higher still, as not all individuals in the community will consult their GP with a complaint of back pain. A recent US study [11] showed an IBP population prevalence of 5% (95% CI 4.2, 5.8) using Calin criteria, with a response rate of 76%. There was no significant change in prevalence when IBP was determined by the ESSG and Berlin criteria, but the ASAS criteria were not used in this study. In a Mexican population study [12] the prevalence of IBP according to the Berlin criteria was lower, at 1.3% (95% CI 1.0, 1.7). This difference may be methodological rather than an example of differing prevalence in different racial groups, as the prevalence in a Hispanic subgroup in the US study remained higher. In the Mexican study, a diagnosis of IBP was made after consultation with a physician rather than on the basis of survey responses.

The prevalence estimates in this study are minimum values, as we have assumed that none of the non-responders have IBP. This may not be the case, since the proportion meeting ASAS criteria did not change significantly between the first and second mailings, although the proportion with chronic back pain did decrease. It seems likely, however, that we have identified most—if not all—patients with IBP. Our finding that 13.5% of patients with a history of back pain met the Calin criteria is not significantly different from the Underwood and Dawes 1995 study [10] in which 46 of 313 patients (15%) with chronic back pain seen over the course of a year in a single general practice fulfilled the Calin criteria.

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**Table 2** Number of individuals meeting IBP criteria stratified by age

<table>
<thead>
<tr>
<th>Age, years</th>
<th>Population</th>
<th>Sample</th>
<th>ASAS positive</th>
<th>Calin positive</th>
<th>Berlin positive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>20–29</td>
<td>751</td>
<td>800</td>
<td>27</td>
<td>44</td>
<td>1</td>
</tr>
<tr>
<td>30–39</td>
<td>996</td>
<td>1088</td>
<td>58</td>
<td>67</td>
<td>5</td>
</tr>
<tr>
<td>40–49</td>
<td>1217</td>
<td>1290</td>
<td>94</td>
<td>98</td>
<td>4</td>
</tr>
<tr>
<td>50–59</td>
<td>1084</td>
<td>1245</td>
<td>107</td>
<td>109</td>
<td>8</td>
</tr>
<tr>
<td>60–69</td>
<td>1183</td>
<td>1210</td>
<td>116</td>
<td>114</td>
<td>6</td>
</tr>
<tr>
<td>70–79</td>
<td>700</td>
<td>793</td>
<td>65</td>
<td>79</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>5931</td>
<td>6426</td>
<td>467</td>
<td>511</td>
<td>28</td>
</tr>
</tbody>
</table>

1.7% using ASAS criteria, 3.0% using Calin criteria and 3.4% using Berlin criteria.
Rheumatology key messages

- The prevalence of inflammatory back pain varies significantly depending on the classification criteria used.
- The minimum prevalence of inflammatory back pain in primary care in the UK is ~3%.

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References


