Underdiagnosis of asthma and COPD: Is the general practitioner to blame?

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C. van Weel

ABSTRACT: ***Underdiagnosis of asthma and COPD: is the general practitioner to blame? C. van Weel.***

This paper analyses, on the basis of a series of general practice studies, the under-diagnosis of asthma and chronic obstructive pulmonary disease (COPD) in terms of the magnitude of the problem, and the implications and factors that contribute to adequate diagnosis. Most patients with chronic or persistent respiratory signs/symptoms present to the general practitioner (GP) and it is the GP who is usually responsible for diagnosis and treatment. An inherent problem of 'early' diagnosis of asthma and COPD is that signs and symptoms that patients experience must be followed over time to establish their chronic-recurrent nature. This approach fits well – in itself – with the general practice principle of continuity of care.

The analysis was mainly based on the "Diagnosis, Intervention and Monitoring of COPD and Asthma (DIMCA)" study that investigated the hypothesis that *early* intervention would enhance the effectiveness of (inhaled corticosteroid) intervention, and for this reason required detection of patients in as early a stage of their asthma/COPD as possible.

Despite the fact that asthma and COPD are being diagnosed more frequently, the proportion of diagnosed to undiagnosed cases has remained stable over the years, pointing to an increase in prevalence in the population. A major factor in under-diagnosis is the fact that patients experience symptoms, but do not present these symptoms to a physician. Reluctance to present symptoms appears to be related to reluctance to take on the role of patient and take (inhaled) medication. This points to patient-perceptions and -values as an important factor in under-diagnosis. This finding is all the more relevant in the light of increasing indications of the value of early treatment.

For GPs and primary care these findings are important. They imply that early intervention will only be possible when a case-finding approach, that evaluates pro-active outcome of respiratory signs/symptoms, is combined with an analysis of patients' perceptions and values.
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For a substantial number of patients with asthma and chronic obstructive pulmonary disease (COPD) in the community their condition has not been diagnosed. Potentially, this failure of diagnosis – 'under-diagnosis' – can severely hamper or postpone effective treatment and this makes under-diagnosis such an important issue in the pursuit of optimal care of patients with asthma or COPD. Early detection and diagnosis of illness in the community is the professional domain of the general practitioner (GP, in North America referred to as: family physician) and before embarking in more detail on under-diagnosis of asthma and COPD, it is important to consider the broader context in which illness in general is perceived by individuals and presented and diagnosed.

Primary care provides the interface between community and professional medical care. Of the many signs/symptoms experienced in the community, only about 10% are ever presented to the GP [1, 2], so most remain un-presented, hence un-diagnosed and consequently not professionally treated. Under-diagnosis is a feature of virtually all diseases, including those where treatment is, from a medical professional opinion, highly desirable [2]. This phenomenon is known as the 'iceberg' of morbidity, with the tip of the iceberg indicating the number of cases professionally identified. The professional role of the GP is to identify early signs and symptoms of morbidity, but also to coach the patient in seeking professional care for relevant health problems and rely on self-care where appropriate [3]. The fact that patients do not present experienced health problems is not necessarily negative. In fact it reflects patients' autonomy and self-reliance, which are important societal values. But this causes a true dilemma for the GP to rock the iceberg and pursue the identification of not routinely presented morbidity. Unless there is sound evidence that this yields better outcome of care, GPs are professionally reluctant to practice active case-finding.

This paper reviews the problem of under-diagnosis of asthma and COPD in general practice and the contributing factors. The review is based on empirical data from research of the Nijmegen Department of General Practice: Ongoing Morbidity Surveillance [4,5] and a longitudinal study programme of early detection and intervention of asthma and COPD in general practice, the Diagno-

sis, Intervention and Monitoring of COPD and Asthma (DIMCA) study [6]. The exploration will focus on:

- the implications of under-diagnosis;
- the magnitude of the problem;
- the factors that contribute.

Implications of under-diagnosis: the hypothesis

For many years the iceberg phenomenon of asthma and COPD has been well documented [7] raising concern about the long-term consequences of delayed treatment, in particular the irreversible loss of pulmonary function (figure 1). This concern was fuelled by the finding of our group in the early 1990s that irreversible loss of pulmonary function was a feature in patients with asthma/COPD in general practice [8]. Particularly when additional treatment with inhaled anti-inflammatory treatment modified this development [9], the potential health gains, in terms of pulmonary function, of long-term intervention in asthma/COPD could be expected. This made it particularly relevant to revisit the problem of under-diagnosis of asthma and COPD. The DIMCA study was based on the hypothesis that *early* intervention would enhance the effectiveness of (inhaled corticosteroid) intervention (figure 1), and for that reason detection of patients in as early a stage of their asthma/COPD was required.

Effectiveness of early intervention: the DIMCA study

The DIMCA study was based on the practice population of ten general practices in the Nijmegen region. Its objective was to assess the effectiveness of inhaled corticosteroid treatment on symptoms, quality of life and in particular pulmonary function in subjects with early signs and symptoms of asthma or COPD. Selection therefore included those with 'minimal' signs/symptoms (figure 2). A 10% sample of the adults (aged 18–70 years) never diagnosed with asthma or COPD before were invited to participate in the case-finding phase. Case-finding followed two consecutive steps: first, all subjects were screened for signs/symptoms of asthma/COPD, and those screening positive were monitored for up to two years, to select patients for three intervention studies. The programme assessed: a) the effectiveness of the inhaled corticosteroid intervention for defined groups of patients; and b) the effectiveness of the early detection and treatment strategy, in comparison to normal care.

In just under half the subjects screened, signs/symptoms of asthma/COPD were identified, the large majority on the basis of *symptoms*. By monitoring, this group could be divided into four subgroups:

1) subjects with persistent, substantial airflow obstruction: 7% of the population;
2) subjects with accelerated decline of pulmonary function: 12% of the population;
3) subjects with persistent mild signs/symptoms: 19% of the population;
4) subjects in whom no persistent signs/symptoms of their airways could be demonstrated: 12% of the population (screening 'false positive') [6].

Intervention with inhaled corticosteroids was effective in the groups 1 and 2, and as a consequence, the whole approach from screening through monitoring to intervention was cost-effective. But the intervention in the group with persistent signs/symptoms failed to be effective [10]. From this it could be concluded that: a) detection of early cases of asthma/COPD is possible at the expense of a one-in-four false positive diagnosis;

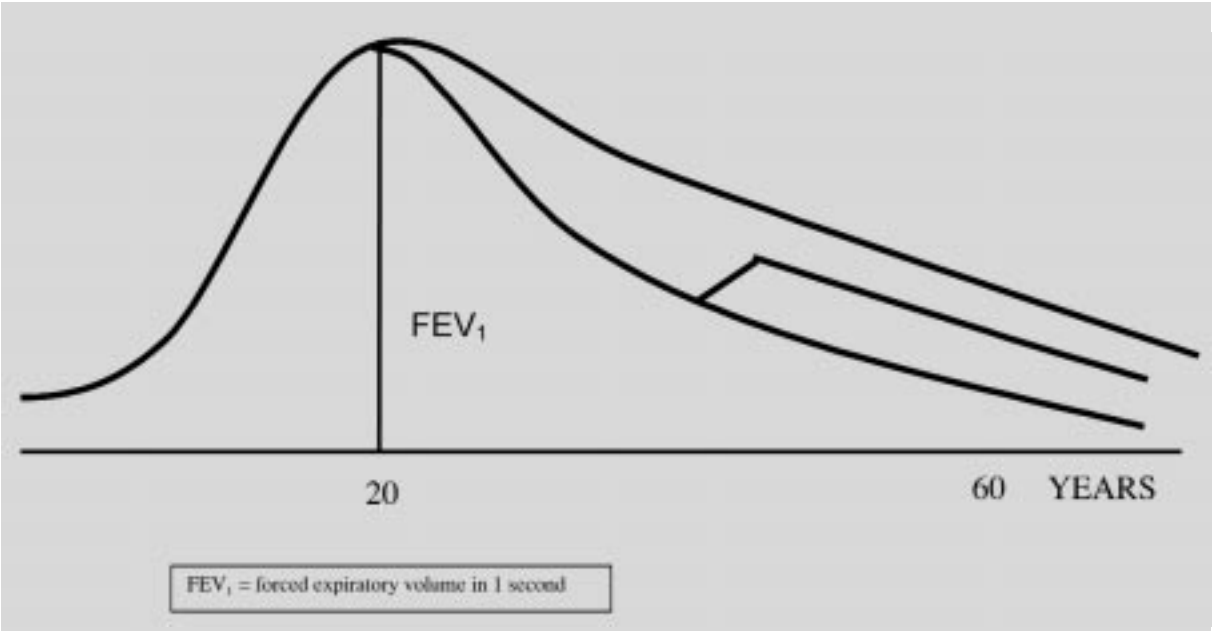

Fig. 1. – Natural growth of pulmonary function from birth to adulthood, followed by: (a) physiological decline (upper line); (b) pathological decline (lower line). Inserted above lower line: the effect of intervention.

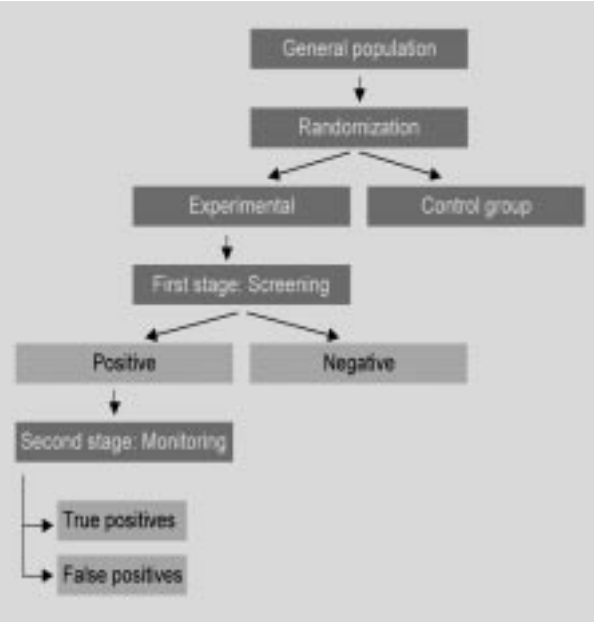

Fig. 2. – Design of the Diagnosis, Intervention and Monitoring of COPD and Asthma (DIMCA) study. From: [6].

and b) about 40 % of those selected do not benefit from treatment.

Scale of the problem

The DIMCA study pointed to substantial under-diagnosis. To put the issue in perspective it was possible to compare the DIMCA findings of 1992 to the situation in Dutch general practice in 1977: in the 15-year period the prevalence of asthma and COPD in general practice did increase from about 2/1,000 to 5/1,000 [7,11]. The increase in numbers of cases under treatment was, however, accompanied by an overall increase in population prevalence, including an increase of unidentified cases. An important difference, however, between 1977 and 1992 was the relation of diagnosis to severity of signs/symptoms. In 1977 under-diagnosis was present to a comparable degree in all levels of severity [7], whereas in 1992 under-diagnosis was by and large restricted to the cases of mild-severity [11].

Determinants of under-diagnosis

There are important physician-related factors in under-diagnosis and guidelines have provided the necessary knowledge and indicated the required skills to promote early detection. In particular spirometry is now available for diagnostic routine in primary care to a large extent.

Patient-related factors in under-diagnosis, however, are less well documented. The DIMCA study gave a number of important indications of the role patient-factors may play. Participation in the study demanded a strong commitment from the participants as it required not only their attendance at a screening session but, during the two-year follow-up programme, participants had to visit their GP every three months, the long-function laboratory twice a year and complete self-recording of signs/symptoms in diaries. Yet, participation was high, up until the time these same subjects were invited to undergo treatment. More than half of them declined the invitation of treatment [12], mainly arguing that they did not consider themselves ill enough and did not like taking drugs [13]. These – by and large unsystematically collected – observations are in accordance with findings of two other studies in the Nijmegen Academic General Practice network. Bottema studied the prevalence of asthma or COPD in general practice, and concluded that a major reason for inadequate treatment was patients' drop-out: a life-time asthma/COPD patient career lasted between 1 and 10 years, with the majority clustering around 2–4 years [14]. This was despite the fact that the *practices* studied, were university-linked and made substantial efforts to enhance continuity of care. KOLNAAR *et al*. screened adolescents and again discovered substantial numbers of undiagnosed asthma. All newly detected cases and their parents were advised to contact their GP and were offered an appointment. However, in the end less than 30% in fact did visit their GP to follow-up the findings at screening [5].

Under-diagnosis: conclusions

Under-diagnosis remains a substantial feature of asthma and COPD, but it particularly involves those with mild signs/symptoms, who have least to gain from intervention. In the first place there is a need for more evidence of the exact health improvements from interventions in patients with mild signs/symptoms. *If* such evidence can be presented, it is quite likely that case-finding and treatment will also be cost-effective. As long as this evidence is lacking, case-finding should focus on patients with more severe signs/symptoms of asthma or COPD.

Physician-related factors are important and efforts to address these by better implementation of guidelines and post-graduate training should be continued. Better access to pulmonary function testing facilities should also be promoted. In this way, adequate diagnosis and treatment of asthma and COPD can be further improved. But at the same time it ought to be acknowledged that part of the problem of under-diagnosis is related to diagnostic uncertainty, and coping with this uncertainty will always be part of general practice.

This analysis has pointed to the fact that patient-related factors are also important in explaining under-diagnosis, but these factors are poorly understood and deserve more attention. It looks as though patient autonomy and the wish to decline effective treatment play a role. This hampers adequate treatment, but at the same time these considerations are related to important societal norms and values. In conclusion, it is too simplistic to blame under-diagnosis on professional shortcomings of GPs. It is recommended to stimulate GPs to act as clinical council of their patients with (signs/symptoms of) asthma or COPD. In this council professional and lay norms and values can

be reviewed together. Even if it is not possible to bridge the gap between the lay and professional view the GP's therapeutic partnership can at least safeguard information for patients to decide upon. This may not eradicate under-diagnosis, but guarantee that at least better use is made of what is possible.

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