Markers to analyse the prescribing of non-steroidal anti-inflammatory drugs in ambulatory care

A guide to pursuing rational and safe prescribing

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Abstract  Objective: The aim of the study is to construct quality markers for rational prescribing of non-steroidal anti-inflammatory drugs (NSAIDs M01A, M01B) in such a manner that they meet three requirements: suitability to be assessed by prescription analysis, application in feedback strategies and contribution to the task of internal quality assurance.

Method: Eight different markers for validating NSAID prescribing were developed according to pharmacological literature. The prescribing of 99 participants (high prescribers) and 15 coordinators of eight pharmacotherapy circles (second quarter 1996) served as the database. To test the validity of the markers in terms of rationality, the NSAID prescribing of 15 randomly selected participants of these circles, whose participants were not trained in the analysis of their prescribing, was compared with the prescribing of the 15 coordinators of these circles, who had considerable experience in pharmacotherapy and group auditing. In order to compare results according to the age and sex of the patients, the two groups treated with NSAIDs were also matched (460 patients in each group). The drugs are classified under the ATC code with the volume given in defined daily doses (DDDs).

Results: Marker 1 – the percentage of NSAID DDDs for recommended drugs, i.e. ibuprofen, diclofenac, indomethacin and naproxen – was significantly higher for the coordinators in comparison with the high prescribers (P < 0.05). Therefore, marker 3 (drugs with questionable efficacy) and marker 5 (‘me-too’ drugs) show an inverse relation. Drugs with a long half-life (marker 2), high-risk drugs (marker 4) and newly marketed drugs (marker 6) were all seldomly prescribed by both groups of doctors. There was no difference between the two groups of prescribers concerning the proportion of elderly people treated with NSAIDs (marker 7). With reference to marker 8 – co-medication with anti-ulcer drugs – the coordinators treated 8.9% of NSAID patients with antacids and anti-ulcer drugs, the high prescribers, on the other hand, treated 12.2% (NS).

Conclusion: The markers can be easily assessed using the information obtained from drug claims and shown to each doctor personally. They call for the doctors to pay special attention to their particular drug selection. The markers can be implemented into feedback strategies of prescribing habits.

Key words  Internal quality assurance · Quality markers · NSAID prescribing

Introduction

Rational prescribing – defined as effective, safe and economical – is by no means a new challenge, but its translation into action is still a question of concern and could be optimized. The decision-making process [1–3] is influenced by a number of factors. These include: the wide range of drugs available, the problem of keeping up-to-date with the rapidly changing body of therapeutic knowledge, the working conditions in hospitals or private practices and the expectations of the patients and the doctors. It was observed that using administrative programmes as prescribing restrictions (lists of drugs not to be reimbursed), financial restrictions (budget) or incentives only temporarily reduces drug costs and prescription volumes. The unintended results of these programmes are not to be underestimated e.g. when doctors are tempted to stop necessary but expensive courses of treatment [4, 5]. In addition to administrative measures guided by cost-consciousness, the qualification and further training of doctors is also important. For approximately three decades numerous states have seen the execution of research projects and practice measures relating to the influential factors involved in doctors’ prescriptions, and the extent
and consequences of irrational prescribing. Above all, possibilities of organizing the prescription procedure in a more rational (in the above-mentioned sense of safe and effective) manner have been explored (for a summary, refer to [6, 7–10]). As literature studies and meta-analysis show, not all studies designed to improve prescribing habits have been controlled effectively, though the effect cannot always be related to the measure [11, 12]. But there seems to be evidence that an effective way of improving ‘prescribing habits’ is personal communication combined with feedback strategies for prescribing practices [8, 12–15]. The analysis of prescribing behaviour is of particular importance, as it serves both as a base for the recognition of problems in prescribing and as the evaluation of the intervention [16, 17].

Improving prescribing habits requires criteria for assessing the quality of prescribing and objectives which are to be changed. The aim of the study was to construct markers for NSAID prescribing in such a manner that they were able to meet three requirements: suitability to be assessed by prescription analysis, application in feedback strategies and contribution to the task of internal quality assurance. The first step was to establish whether literature-based indicators are suitable as a means of showing variations in doctors’ prescribing behaviour. Thus we investigated whether these indicators could be implemented as quality indicators. The second step was to demonstrate, using examples, how the selected indicators were presented in a prescription analysis. The background of the study was drawn from the experiences of the authors in continuing medical education and quality assessment within the concept of pharmacotherapy circles [13, 16, 17].

**Materials and methods**

The drugs selected for study were the non-steroidal anti-inflammatory drugs (NSAIDs) with ATC codes M01A and M01B [18, 19]. The prescriptions issued by the participants of eight pharmacotherapy circles were selected as the material for the database. These prescriptions were issued by 114 family doctors (99 high prescribers and 15 coordinators) to 32870 patients between 1 April and 30 June 1996. One of these circles is chosen as an example to show, in keeping with our second objective, the application of the markers in group auditing (Fig. 1 and Table 3).

The markers were developed based on suggestions from pharmacological literature. Table 1 gives an overview of the markers and the intended purpose.

Markers 1–6 are expressed as the percentage of the prescribed defined daily doses (DDDs), which apply to each of the respective markers of all NSAID prescriptions. Markers 7 and 8 are expressed in terms of the percentage of the NSAID patients who show these specific features. In order to determine whether the suggested markers describe ‘rational’ prescribing, we compared the prescribing profile of two groups of general practitioners who differed in their training in pharmacotherapy: one group comprised 15 coordinators of the pharmacotherapy circles. These family doctors are trained in pharmacology and they have considerable experience in running pharmacotherapeutic group auditing [13, 16, 17]. We took this group as a reference point and compared their prescribing profile with a group of family doctors (‘high prescribers’) who were voluntary participants of pharmacotherapy circles. The members of the latter group have no training in analysing their own prescribing costs. They were invited to the pharmacotherapy group due to their prescribing costs. The two groups of doctors also differed according to the number of prescribed NSAID DDDs per patient: coordinators: 23.5 DDDs per patient, high prescribers: 30.8 DDDs per patient. It would be expected for the coordinators of pharmacotherapy circles to show a higher percentage of prescribed defined daily doses (DDDs) for marker 1 and a lower percentage for markers 2–6, respectively. We would also expect a lower prevalence for markers 7 and 8 in the group of trained doctors compared with the high prescribers.

To compare the two groups of doctors effectively they had to be divided on the surgery level and also the patient level. In the first stage, therefore, 15 surgeries were randomly selected from the 99 high prescribers. In contrast to the coordinators, there were more patients on medication in the high prescribers’ surgeries and this consequently meant that there were more patients being treated with NSAIDs (coordinators 460 vs. high prescribers 712 M01A/M01B patients). Since it is a well-known fact that age and sex have considerable influence on prescribing, the second stage involved the grouping of the coordinators’ and high prescribers’ patients according to age and sex. Thus, an M01A/B patient of the same sex was found for each M01A/B patient of the coordinators. These pairs had a maximum age difference of 2 years. On average the age difference between the two groups amounted to 0.05 years. The following two groups were compared:

1. Coordinators: 15 doctors, M01A/B patients: n = 460 (male 160, female 300), mean age: 56.82 years.
2. High prescribers: 15 doctors, M01A/B patients: n = 460 (male 160, female 300), mean age: 56.77 years.

For each doctor the total number and the percentage of prescribed daily doses of NSAIDs for the various markers was calculated. The Wilcoxon 2 sample test was used for group comparison (markers 1–6). The influence of the physicians’ group on prescribing (markers 7 and 8) was analysed with a logistic regression analysis (software SAS for Windows, version 6.04).

We obtained the following information from the prescriptions: patient (anonymised), age and sex of the patient, brand name of the drug, active agents by ATC classification, number of the packages and package size (DDDs) and the name of the prescribing doctor. The drugs are classified under the ATC code [18] with the volume given in defined daily doses as an international standard to quantify drug utilization. We used the DDDs as assigned by the World Health Organization (WHO) Collaborating Centre for Drug Statistics Methodology [19] and by the Research Institute of the Local Health Care Funds (Wissenschaftliches Institut der AOK) for specialties of the German market (unpublished).

**Results**

With reference to the first objective, i.e. whether the markers are suitable for assessing rational prescribing, the result is given as a mean and median percentage of the DDDs (and the range with the minimum and maximum) for markers 1–6 and as percentage of NSAID-treated patients for markers 7 and 8. Both groups of doctors differed according to drug selection as follows:

Marker 1 “Percentage of recommended drugs”

The comparison of the prescribing habits of the 15 coordinators and the 15 high prescribers shows a higher percentage for the coordinators (mean 78%, median 79.8%) compared with the high prescribers (mean 63.2%, median 65.9%). Marker 1 was tested (Table 2). The difference is significant ($P < 0.05$) and confirms our hypothesis.