Prescribing pattern of general practitioners for osteoarthritis in primary care settings in Bolu, Turkey

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ABSTRACT

Objective: To assess the drug preferences of primary care physicians for osteoarthritis (OA) in comparison with the current guidelines, and their reflections in the cost of prescriptions.

Methods: Data were collected from all primary health care centers in Bolu, Turkey, during November 2002 from patient polyclinic logbooks. Drugs prescribed were classified according to the Anatomical Therapeutic Chemical Classification system for comparison purposes. Gender, age, and health insurance of patients were analyzed for drug preferences and costs.

Results: Forty-eight primary care physicians prescribed 1,047 drugs for 507 OA patients with total a cost of $10,254. Anti-inflammatory and antirheumatic products were the leading group accounting for 59.6% of the prescribed drugs, and 84.1% of the total expenditure. Paracetamol, the most commonly recommended in the guidelines, constituted 6.9% of all prescribed drugs and 0.9% of the total cost. Drug preferences showed a statistical difference among the health insurance types while drugs' cost showed statistical significance among the gender and health insurance types. Cyclooxygenase-2-specific inhibitors were the most commonly prescribed subgroup, constituting 23.2% of prescribed drugs and 62.6% of the total expenditure.

Conclusions: Paracetamol in practice was not the first-line drug preferred by primary care physicians. Drug prescription data showed that the preference of drugs was affected by health insurance types and the gender of patients in favor of expensive, new drugs. There is a need for improvement of drug prescriptions to reflect current recommendations and guidelines.

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Osteoarthritis (OA) is the most common chronic disease of the joints, characterized by pain, typically worse with weight bearing and activity, stiffness after inactivity, and loss of function.[1,2] Its onset is age-related and it differs from men and women, generally affecting men younger than 50 years, women older than 50 years, and with its increasing prevalence by the aging population, it continues to be a major public health problem treated most of the time by primary care physicians.[3-5] In America, OA cases are 16-21 million, England and Wales 1.3-1.7 million, France 9-10 million, and Australia 1.2 million.[1,2,6-8] In Turkey, according to the National Burden of Disease Study results, OA is ranked as 7th in the list of the national disability-adjusted life years calculations for the first 20 diseases.[9] A number of organizations, the European League Against Rheumatism, the Royal College of Physicians, and the American College of Rheumatology, have published treatment guidelines that propose a combination of nonpharmacological and pharmacological approaches to achieve the goals of OA therapy, including pain control, maintenance or improvement of joint movement, and limiting functional impairment.[1,2,5] There is a considerable agreement among those guidelines that paracetamol is recommended consistently as the initial oral analgesic based on its overall efficacy, toxicity profile, and cost when compared with nonsteroidal anti-inflammatory drugs (NSAIDs) including new generations, cyclooxygenase-2-specific inhibitors (COX-2-specific inhibitors) supported by cost-effectiveness studies for OA of different joints.[5,10-12] The Primary Care Diagnostic and Therapeutic Guideline of Turkey published by the Ministry of Health (MoH) also reflects the same agreement in OA treatment.[13] Given the high prevalence of the disease, it is

obvious that therapeutic approaches are shared between the primary and secondary care centers.[14] In Turkey, primary care is mostly provided by graduate physicians, as family medicine specialization is still in the early stage of development. Prescription of OA has, not only a medical side but also an economic side, affecting and affected by health insurance type. When assessing the financing side of healthcare, Turkey's social security system is tripartite. The Sosyal Sigortalar Kurumu (Social Insurance Institution) is the single, largest insurer for blue-collar workers; Bag-Kur for self-employed, and Emekli Sandigi (retired fund) and Civil Servants for white-collar public employees. Co-payment for drugs is 20% for active, and 10% for retired members of these insurance schemes. The total cost of these 3 schemes for pharmaceuticals for 2001 was estimated to be 48.5% of their total health expenditures. There is also a program named Green Card (Yesilkart) for the poor, however, it does not pay for out patient visit prescriptions. Still there are people without insurance, who have to pay for their prescriptions.[15,16] Our aim in this study is to assess whether the current prescription practice of primary care physicians reflects the guidelines, and its effect on costs of prescriptions for OA.

Methods. This study was conducted in Bolu, west Black sea region between the 2 largest cities of Turkey, Istanbul and Ankara with a population of 268,829.[17] Nearly 25% of the population was aged ≥50 years. In November 2002, there were 30 primary healthcare centers (PHCCs), of which 25 provided polyclinic services with 48 physicians. All PHCCs providing polyclinic services were included in the study with no sampling. There is no national or regional collected data for drug prescriptions of physicians that can be used either by health insurance institutions or the MoH. Therefore, patient polyclinic logbooks designed by the Project Coordination Unit of MoH with auto-carbon pages were examined to obtain data on drug prescriptions by the primary care physicians with a written permission from the Undersecretary of MoH. While all cases with a written OA diagnosis alone or with another acute or chronic disease were included in the study, the drugs prescribed for diagnosis other than OA were excluded. Physicians wrote 507 prescriptions for 507 OA patients (in the study period, each patient applied to PHCCs only once, therefore each patient received only one prescription). Only 4 prescriptions, containing one drug each, were not included in the study, as they could not be read due to bad handwriting. Drugs prescribed for OA were classified according to the Anatomical Therapeutic Chemical Classification (ATC) system. According to the ATC classification, 6 ATC classes were identified in the prescriptions: A - alimentary tract and metabolism; H02 - systemic corticosteroids; M01 - anti-inflammatory and antirheumatic products; M02 - topicals; M03 - myorelaxants, and N02, analgesics. Cost of prescriptions for OA was classified into 3 groups for analysis.

Descriptive statistics including frequency and cross-tabulation were used to analyze physicians' drug prescription data. Chi-square test was performed to determine the presence of statistically significant differences among the selected variables and differing groups are controlled by Epi Info®. The statistical significance was considered as $p<0.05$.

Results. Primary healthcare physicians in Bolu, Turkey, prescribed 1,047 drugs for 507 patients with OA diagnosis. Of the patients, 343 (67.7%) were female and 438 were above the age of 50 (86.3%) with mean age 62.06±11.99. Mean drug number per prescription was 2.07±0.95. The distribution of drugs prescribed and their cost according to ATC classes are summarized in **Table 1**. Mostly preferred ATC class for OA was M01 with 59.6% (n=622). The M01AH, a subgroup of M01 class, namely COX-2-specific inhibitors, celecoxib, and rofecoxib, was found as the most commonly prescribed (39%, n=242). Paracetamol was 6.9% of all prescribed drugs, and 0.9% of their total cost was under N02. The prescribed drugs showed significant differences among members of different insurance schemes (p=0.001) as seen in **Table 2.** The cost of prescribed drugs was statistically significant among gender and insurance type as seen in **Table 3**. Physicians prescribed a higher ratio greater than $40 for females. The average cost of prescriptions according to health insurance types changes between $10.2±6.8 for SSK members to $24.8±0.0 for ES members. Physicians' drug preferences for SSK members, when compared with other health insurance institutions, were for less expensive drugs with the highest ratio of $20.

Table 1 - Number and expenditure of drugs prescribed for osteoarthritis according to the anatomic therapeutic chemical classification.

Classes	N	(%)	Cost ($)	(%)
A	101	9.7	553	5.4
H02	31	3.0	87	0.9
M01	622	59.6	8,624	84.1
M02	88	8.4	393	3.8
M03	70	6.7	388	3.8
N02	131	12.6	209	2.0
Total	**1,043***	**100**	**10,254**	**100**

A - alimentary tract and metabolism, H02 - systemic corticosteroids, M01 - anti-inflammatory and antirheumatic products, M02 - topicals, M03 - myorelaxans, N02 - analgesics, *Four drug names in 4 prescriptions not included.

Table 2 - Distribution of prescribed drugs according to the anatomic therapeutic classes (%).

Distribution	A	H02	M01	M02	M03	N02	Total	*P*-value
Gender (n=1043)								
Male	9.2	3.2	58.6	8.7	9.0	11.3	**346**	0.431
Female	9.9	2.9	60.1	8.3	5.6	13.2	**697**	
Age groups (n=1043)								
<50	12.9	0.8	62.1	6.8	5.3	12.1	**132**	0.322
50-65	9.5	3.8	56.0	9.1	7.1	14.5	**505**	
>65	8.9	2.7	63.3	8.1	6.7	10.3	**406**	
Health insurance schemes (n=963)								
ESCS	16.0	1.3	57.0	9.4	5.3	11.0	**319**	
Bag-Kur	7.4	2.6	65.4	6.8	6.3	11.5	**459**	0.001*
SSK	4.4	6.3	54.1	10.1	7.5	17.6	**159**	
Green Card	3.8	3.8	57.9	19.2	11.5	3.8	**26**	

A - alimentary tract and metabolism, H02 systemic corticosteroids, M01 - anti-inflammatory and antirheumatic products, M02 - topicals, M03 - myorelaxans, N02 - analgesics, ESCS - Emekli Sandigi and Civil Servants, SSK - Sosyal Sigortalar Kurumu, *Green Card subgroup not included in the analysis

Table 3 - Distribution of expenditure of prescriptions for osteoarthritis.

Distribution	Cost ($)			Total	*P*-value
	<20	20-40	>40		
Gender (n=503)					
Male	54.6	41.7	3.7	**163**	0.029
Female	52.6	36.8	10.6	**340**	
Age Groups (n=503)					
<50	45.6	45.6	8.8	**68**	0.457
50-65	57.0	34.5	8.5	**235**	
>65	51.5	40.5	8.0	**200**	
Health insurance schemes (n=469)					
ESCS	42.4	43.7	13.9	**158**	
Bag-Kur	50.0	42.0	8.0	**224**	0.001*
SSK	90.5	9.5	0.0	**74**	
Green Card	69.2	30.8	0.0	**13**	

ESCS - Emekli Sandigi and Civil Service, SSK - Sosyal Sigortalar Kurumu, , *Green Card subgroup not included in the analysis

Discussion. Our patients were found to have similar age and gender characteristics being predominantly female (67.7%, n=343) and above the age of 50 (86.3%, n=438).[3,5] Although paracetamol is recommended consistently as the first-line treatment based on its overall efficacy, toxicity profile, and cost, we could find it in only 6.9% of the prescriptions constituting 0.9% of their total cost.[5,10-13] This ratio was strikingly low. There are discrete results in the literature on prescription practice of physicians for OA when compared with our results. One study where family physicians were asked to provide their initial treatment for a hypothetical uncomplicated OA, showed that 97% of family physicians responding (78%) chose NSAIDs as their first-line therapy of OA.[18] Another study, using hypothetical OA cases of different stages to show prescription patterns of general practitioners (GPs), found that paracetamol preferences changed according to different stages of OA cases, falling from 90% to 50%, and increasing preference for NSAIDs more than 70%. However, there was still a number of GPs recommending NSAIDs as a first-line treatment even in mild cases.[5,19] Another study where GPs were asked of their treatment preference for OA reported that 57% would prescribe a simple analgesic or a compound analgesic before trying NSAIDs, and only 15% of them prefer conventional NSAIDs as their first-line treatment.[20]

In our study, paracetamol preferences of physicians were strikingly less than these studies, which may be partially explained by their data collection by using hypothetical cases or directly asking the physicians on their actual daily practice. This result may also be related to their ignorance, or influence by the pharmaceutical companies, or as paracetamol is not accepted as a

glamorous drug by physicians, or may be unaware of the cardiovascular system and renal side effects of the NSAIDs, however, these possible effects cannot be addressed in our study.

When looking from the rheumatologists' side, most (82%) recommend paracetamol as a first-line treatment for mild to moderate pain in preference to ibuprofen, aspirin, and other NSAIDs, and overall paracetamol was the most frequently prescribed analgesic. It was also reported that the introduction of celecoxib and rofecoxib led to a change in the preferences of physicians resulting in a decrease in level of recommendations for ibuprofen, aspirin, and other NSAIDs and did not affect the paracetamol recommendations.[5] A newly published study conducted for the determination of drug treatments of chronic OA of the hip or knee by rheumatologists showed 75.5% ratio of paracetamol prescription.[21] Obviously, rheumatologists follow guidelines far more than primary care physicians.

One study showed significant gender differences in the pattern of NSAIDs use for OA treatment independent of the risk for gastrointestinal side effects and self-reported symptoms, where females were prescribed with NSAIDs with greater degree of COX-2 selectivity.[22] We found no gender differences in the pattern of prescribed drugs. However, there was a statistically significant difference in the prescription cost showing the tendency toward expensive drug preferences of physicians for females, which can support the gender difference taking place in literature. There were also studies pointing out the racial and ethnic differences in favor of Caucasians when compared with blacks and Hispanics, not only for OA diagnosis as well as diagnosis free of NSAIDs usage. Also COX-2 selectivity preference for Caucasians was high when compared with other ethnicity and races.[23,24] It is well presented that changes in the prescribing practice of physicians in favor of the existing high cost of medicines were responsible for the rise in prescription expenditure.[14,25] This was also true for older female patients, and those with a relevant history of peptic ulcers switching from nonselective NSAIDs to COX-2 inhibitors.[26] Another example of shifting prescribing patterns and increased use of new drugs can be celecoxib, in the North Caroline Medicaid Program as its number of units dispensed per person-year increased from 0 in 1998 to 1.9 in 1999, and 7.0 in 2000 with an expenditure of $13 million in 2000.[21] Similar changes can also be supported by the expenditure of celecoxib in Turkey increasing from $10.4 to 14.4 million from 2000 to 2002.

Our study, which focused on OA cases, also showed high cost of 2 new molecules of COX-2-specific inhibitors, constituting 62.6% of the total drug prescription cost, and they were recommended for nearly half of the patients. It is obvious that some patients can receive additional benefit with these new drugs, however, the extent of benefit achieved with more expensive medication is not always clear, and it may also be difficult to assess clinically.[23] Although COX-2 inhibitors have no evidence of a difference in efficacy from NSAIDs other than the reduced risk of gastrointestinal toxicity, it was determined that the established risk factors for NSAIDs-associated gastrointestinal toxicity were poor predictors of COX-2 inhibitor prescription while physician prescription preference was an important determinant.[27] Health insurance of the patient affects the prescriptions of drugs for OA treatment in a study carried out for hypertension.[28] Primary care physicians did not prefer to prescribe COX-2-specific inhibitors for SSK members when compared with members of other social security schemes. Physicians' drug preferences are changed based on the type of patients' health insurance, and can be explained by the frequent change of payment policies of the institutions. This is due to the high drug expenditures that primarily affect the newly marketed, expensive drugs, and by using health insurance as a proxy for patients' ability to pay, which leads to access inequalities.

Our study had limitations such as being a cross-sectional observational study, however, this could also be an opportunity showing the current daily prescribing practice of physicians unlike prescribing for hypothetical OA cases and self-declaration of drug preferences. The main limitation of the study referred to the fact that the disease stage of patients was not known, which can be an important factor in physicians' preferences.

In conclusion, prescription is ultimately at the discretion of the clinician, however, cost-benefit and cost-effectiveness of the treatments should also be considered as indicated in the current guidelines. We found that physicians' daily practice for the treatment of OA was different from the published guidelines, and it is affected by health insurance and gender of the patients leading to high cost. Primary care physicians should develop rational prescribing practices with an acceptable and affordable cost for members of all health insurance schemes considering the increasing trend of drug expenditures within health systems. We need to improve prescription patterns of our physicians by prescription audits and feedback to physicians on their prescribing habits with their cost and pharmacotherapy training.

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