GENERAL

HOW TO IDENTIFY OSTEOPOROTIC PATIENTS' ATTITUDE TOWARDS PHARMACEUTICAL PRACTICE?

EDIT VESZELYNÉ KOTÁN*, ZOLTÁN VINCZE and ÁGNES MÉSZÁROS

Semmelweis University, University Pharmacy Department of Pharmacy Administration,
7-9 Hőgyes Endre Street Budapest, 1092 Hungary

Abstract: In ageing populations, osteoporosis is a serious problem. Low adherence to osteoporotic therapies is a well-known fact. There is a crisis in the therapy of osteoporosis: even with a diagnosis of osteoporosis or after an osteoporotic fracture there are patients without adequate therapy. The aim of the study was to analyse the association between the patients' subjective importance of osteoporosis and medication adherence, quality of life, depression status and self-reported socio-economic factors, and find the risk groups which can be identified in the community pharmacy setting to improve the quality of care of osteoporotic patients. A cross-sectional study was conducted in four public hospitals in Hungary. Medication adherence was measured by the Morisky Medication Adherence Scale, quality of life was measured by the EQ5D-3L, depression status was checked by the Beck Depression Scale. Patients were asked to what extent their life was affected by osteoporosis compared to their chronic co-morbidities. Three patient groups were analysed: High, Low and No osteoporosis importance groups. Statistical analyses were carried out by SPSS program. Significant differences were found between the groups of osteoporosis importance in age, T-score, working status, type of the medication, existing fracture, frequency of pain and number of chronic diseases. The main target of pharmaceutical therapy management is to maintain a therapy-length lasting, periodic contact with the osteoporotic patient to improve the patients' subjective perception of the quality of life. Improving the importance of the disease in patients with low osteoporosis importance could help to improve the patients' quality of life.

Keywords: quality of life, osteoporosis, pharmaceutical care, patients preferences

Osteoporosis (OP), which is the main cause of increased fracture risk and bone fractures, is based on the modification of the bone structure. This disease affects 7 to 10% of the Hungarian population, which means approximately 150 thousand patients treated per year (1). The burden of the disease is increasing year by year. In ageing populations world-wide, OP is a serious problem, since its consequences impact the quality of life. Low adherence to osteoporotic therapies is also a well-known fact (1-5). Adequate management of OP similarly to most chronic diseases, requires that patients take their medicines correctly, regularly and remain on therapy for a long period (6, 7). Over the long term, there are osteoporotic patients with no treatment or a short treatment with no therapeutic effectiveness (8). Although health care professionals had high expectations from bisphosphonates (BP) in the early 2000s, the problem is still not solved. There are scientists who are talking about a crisis in OP treatment

nowadays: even with a diagnosis of OP or after an osteoporotic fracture there are patients without adequate treatment (9-11).

OP is associated with chronic pain, impaired physical ability, reduced social activity, depression, even without the presence of a fracture. This leads to a reduced quality of life. As OP is mainly an asymptomatic disease until a fracture occurs, it is very hard for patients to understand the importance of risk reduction, which is the main goal of their therapy. Therapy management in OP should be personalized to improve adherence, and pharmacists could be one group of healthcare providers whose interaction with the patients would help to improve it (5). During dispensing, pharmacists have the opportunity to focus on high-risk osteoporotic patients, and to find patients with a possible high risk of nonadherence (12). As Murphy-Menezes stated: „pharmacists play a crucial role in ensuring that patients achieve optimal therapeutic outcomes.”(6) They are proven

* Corresponding author: e-mail: eveszely@gmail.com

to be able to improve patients adherence: they are trusted medication experts and they have the knowledge and techniques to use in the everyday practice (13-16).

Even if the clinician can identify the patients with a risk of noncompliance and there are proven risk factors for nonadherence, the subjective reasons which lead to surrender the antiporotic treatment are still to be understood (17, 18). Part of these subjective reasons may be the presence of another chronic disease, which could impact patients’ attitude towards OP. The aim of this study was to analyse the association between patients’ subjective attitude, medication adherence, quality of life, depression status and the self-reported socio-economic factors to improve the disease management of the osteoporotic patient.

Methods

200 osteoporotic patients were randomly involved in this cross-sectional study from 4 public hospitals in Hungary, with a Rheumatology ward and/or an OP unit. Subjects’ inclusion criterion was diagnosed OP. Out of the 200 patients, 9 patients met the exclusion criterion that was having any malignant disease. In total, 191 patients were enrolled in the study.

Subjects who took part in the DXA-scan (dual-energy X-ray absorptiometry) during the time of the study were invited to the study by the pharmacist. Osteoporotic patients were asked to fill in a set of questionnaires after signing informed consent. The study was ethically approved by the Regional and Institutional Committee of Science and Research Ethics of Semmelweis University.

The patients’ quality of life was evaluated with the EQ5D-3L and the Visual Analogue Scale (VAS) (19, 20). Medication adherence was investigated with the Hungarian version of ©MMAS-8, and patients’ psychological status was mapped with the brief version of the Beck Depression Inventory (21-25). ©MMAS-8 and EQ5D-3L are short, disease non-specific questionnaires, and are easy to use in the public pharmacy setting, where the pharmacist needs to have a nearly complete impression about the status of the patient in a short time. DXA T-score results of the femoral neck were taken into consideration in the study. Patients’ socio-economic status and chronic co-morbidities were also taken into account. Fragility fractures, frequency of pain, as well as the analgesic method were recorded. Patients were asked when they were diagnosed with OP, and to what extent their life was affected by their OP, compared to the other chronic diseases. Co-morbidities were given in disease groups as follows: high blood pressure, cardiovascular disease (excluding high blood pressure), other musculoskeletal diseases, diabetes (any forms), inflammatory bowel diseases, epilepsy, asthma, chronic obstructive pulmonary disease (COPD), other diseases.

The comparison was carried out by asking patients to rank order their chronic diseases, including OP, on the basis of how important they felt the diseases impacted their lives. To analyse patients’ subjective feelings of their OP based on its importance in their daily living, three groups were created according to patients’ ranking order of their OP. Those patients who ranked OP to the first place were called the *High OP importance* group. The *Low OP importance* group consisted of the patients who

Figure 1. Medicine types taken by the patients in the study

Table 1. Main demographic and clinical characteristics of patients.

Factor	Categories	N (%)	Mean (SD)
Gender	Male Female	17 (8.9) 174 (91.1)	NA
Age (years) n = 191	< 55 years 55–65 years 65–75 years 75 < years	23 (12.0) 54 (28.3) 73 (38.2) 41 (21.5)	66.9 (9.4)
Time spent from diagnosis (years) n = 168	< 1 year 1–5 years 5–10 years 10–15 years 15–20 years 20–25 years	20 (11.9) 48 (28.6) 43 (25.6) 33 (19.6) 16 (9.5) 8 (4.8)	8.5 (6.4)
BMI n = 191	< 18 18 ≤ BMI < 25 normal 25 ≤ BMI < 30 overweight 30 ≤ BMI < 35 I. grade obesity 35 ≤ BMI < 40 II. grade obesity 40 ≤ BMI III. grade obesity	1 (0.5) 76 (39.8) 76 (39.8) 25 (13.1) 4 (6.3) 1 (0.5)	26.2 (4.5)
Number of chronic diseases parallel to osteoporosis n = 191	NO 1 2 3 or more	30 (15.7) 71 (37.2) 56 (29.3) 34 (17.8)	NA
Qualification n = 191	Elementary school High school diploma Profession with high school Higher studies Other	46 (24.1) 29 (15.2) 53 (27.7) 61 (31.9) 2 (1.0)	NA
Family status n = 188	Married/lives in relationship Lives alone	97 (51.6) 91 (48.4)	NA
Work status n = 191	Active worker Retired Disability pensioned Other status	42 (21.9) 134 (70.2) 12 (6.3) 3 (1.6)	NA
Fragility fractures n = 191	No fragility fractures 1 fracture Multiplied fractures on the same location Multiplied fractures on different locations	107 (56.0) 53 (27.8) 13 (6.8) 18 (9.4)	NA
Fracture types n = 84	Forearm Vertebral Hip Other	53 (63.1) 25 (29.8) 11 (13.1) 17 (20.2)	NA
T-score (DEXA results)	NA	183 (95.8)	-2.828 (0.828)
Antiporotic treatments n = 191	Calcium and/or vitamin-D Bisphosphonate oral Bisphosphonate intravenous Denosumab Other (Raloxifene, Calcitonine or Teriparatide) Does not remember No treatment	23 (12.0) 70 (36.7) 29 (15.2) 10 (5.2) 6 (3.1) 43 (22.6) 10 (5.2)	NA
Frequency of bone and muscle pain n = 191	NO pain < 1 day a week 2–3 days a week 4–6 days a week Daily	6 (3.1) 39 (20.4) 31 (16.2) 27 (14.1) 88 (46.1)	NA
Analgesic method n = 191	Prescribed medicine OTC medicine Other Irrelevant	105 (55.0) 62 (32.5) 16 (8.4) 8 (4.2)	NA

Table 1. Continued

Factor	Categories	N (%)	Mean (SD)
Chronic diseases parallel to osteoporosis n = 191	High Blood Pressure (HBP) Cardiovascular Diseases (excluding HBP) Other musculoskeletal diseases Diabetes (any forms) Asthma, COPD Inflammatory Bowel Disease (IBD) Other diseases	103 (53.9) 57 (29.8) 37 (19.4) 36 (18.8) 20 (10.5) 24 (12.6) 27 (14.1)	NA
Rank of osteoporosis in patient's chronic diseases n = 191	No rank 1st 2nd ≥ 3rd	64 (33.5) 44 (23.0) 50 (26.2) 33 (17.3)	NA
Adherence level ^a (according to the results of ©MMAS-8 ^a) n = 188	Low Medium High	24 (12.8) 72 (38.3) 92 (48.9)	NA
Beck depression scale result n = 191	0–9 normal 10–18 moderate 19–25 intermediate 26 < severe depression	28 (14.7) 132 (69.1) 21 (11.0) 10 (5.2)	14.0 (4.9)
EQ5D	NA	191(100.0)	0.630 (0.325)
Visual analogue scale results	NA	191(100.0)	65.0 (18.6)

^a Use of the ©MMAS is protected by the US and International copyright laws. Permission for use is required. A license agreement is available from Donald E. Morisky, MMAS Research (MORISKY), 294 Lindura Court, Las Vegas, NV 89138; dmorisky@gmail.com

ranked OP to any other places, and the *No OP importance* group consisted of the patients who did not rank OP at all.

In this study, the correlations were analysed between the factors affecting the therapeutic behaviour of the patients in three groups according to the importance of OP. Paired difference tests were carried out between these groups. Statistical analyses were carried out with IBM SPSS 22 software program.

RESULTS

Characteristics of the patients are summarized in Table 1. The medium age of the study population was 66.9 ± 9.4 years, having a minimum of 42 years, and a maximum of 88 years. The duration since the diagnosis ranged from 0 years (less than or equal to 1 year) to 25 years with a mean of 8.5 ± 6.4 years.

Medical treatments, fractures, T-scores and chronic co-morbidities

181 patients (94.8%) took medicine for their disease according to the algorithm of the pharmacologic treatment of OP (20). The medicine types are presented in Figure 1.

44.0% of the patients had one or more fractures related to their OP before they filled the question-

naire. Among these patients, there were 13 (15.5%) with multiple fractures on the same location and 18 patients (21.4%) with multiple fractures on different locations. T-score results were available for 95.8% of the patients. 151 (79.0%) patients had equal or lower T-scores than -2.5, which is defined as the diagnostic requirement for OP.

Patients were asked about their chronic co-morbidities. No other chronic diseases were reported by 15.7% (n = 191) of the patients. There were no patients with epilepsy, and we found 9 patients with malignancies, who were excluded from the study. 161 patients (84.3%) had the following number of chronic co-morbidities: 37.2% had one other chronic disease, 29.3% had two, 11.0% had three and 6.8% had four or more chronic diseases parallel to OP. 23.0% of the patients ranked OP to the first place. There were 64 patients who did not rank OP at all (33.5%). In Figure 2, the number of chronic diseases of patients who ranked OP to any place is summarized.

Importance of osteoporosis

Significant differences were found between the groups of OP importance in age, T-score, working status, type of medicine, medicine taking, existing fracture, frequency of pain, chronic disease, number of chronic diseases. These results are shown in Table 2.

The distribution of the patients' reported importance of OP in the various medication groups is shown in Figure 3.

Medication adherence levels in the three groups of OP importance are presented in Figure 4.

EQ5D

Figure 5 shows the patients' 1, 2 or 3 answers to the various EQ5D dimensions in the different groups of OP importance.

Patients' EQ5D values in the different groups of osteoporosis importance are presented in Figure 6.

DISCUSSION

Since the aim of the study was to analyse the relationship between the patients' subjective attitude and the OP therapy, it can be assumed that the study might help pharmacists in their daily practice of dispensing antiporotic medicines.

Pharmaceutical therapy management has major importance in Hungary. As it is regarded as a basic public service in the country, its legal framework requires that therapy assessment should be based on safe medication use, focusing on dosing, timing,

Figure 2. Patients' rank of osteoporosis and the number of chronic co-morbidities

Figure 3. Importance of osteoporosis in the groups of medications

Table 2. Patients' characteristics in the groups of OP importance.

Factor	High OP importance (n = 44)	Low OP importance (n = 83)	No OP importance (n = 64)	P ^a
BMI Mean	26.5 (SD 4.8, SE 0.7)	26.4 (SD 4.2, SE 0.5)	25.9 (SD 4.7, SE 0.6)	0.781
Age Mean	70.0 (SD 8.0, SE 1.2)	66.8 (SD 8.5, SE 0.9)	65.0 (SD 10.8, SE 1.4)	0.023
T score Mean	-3.095 (SD 0.944, SE 0.144)	-2.871 (SD 0.750, SE 0.083)	-2.576 (SD 0.781, SE 0.102)	0.006
Gender: Men Women	2 (4.6%) 42 (95.4%)	6 (9.4%) 58 (90.6%)	9 (10.8%) 74 (89.2%)	NS
Family status: Living alone Not living alone	23 (52.3%) 21 (47.7%)	35 (42.2%) 48 (57.8%)	34 (53.1%) 30 (46.9%)	0.306
Working status: Active worker Retired	2 (4.6%) 42 (95.4%)	19 (22.9%) 64 (77.1%)	21 (32.8%) 43 (67.2%)	0.016
Time spent from diagnosis: Less than 5 years More than 5 years	17 (38.6%) 27 (61.4%)	31 (37.3%) 52 (62.7%)	20 (31.3%) 44 (68.7%)	0.363
Medicine taking: Yes No	44 (100%) 0 (0%)	81 (97.6%) 2 (2.4%)	56 (87.5%) 8 (12.5%)	0.005
Medicine takers: Knows the medicine Does not remember	29 (65.9%) 15 (34.1%)	67 (82.7%) 14 (17.3%)	32 (57.1%) 24 (42.9%)	0.001
Medicine type ^a : Calcium and/or Vitamin-D BP ^b oral BP ^b intravenous Denosumab Other antiporotic Does not remember No medicine	8 (21.7%) 14 (20.0%) 2 (6.9%) 6 (60.0%) 2 (33.3%) 15 (34.9%) 0 (0.0%)	10 (43.5%) 37 (52.9%) 19 (65.5%) 2 (20.0%) 1 (16.7%) 12 (27.9%) 2 (20.0%)	5 (34.8%) 19 (27.1%) 8 (27.6%) 2 (20.0%) 3 (50.0%) 16 (37.2%) 8 (80.0%)	0.001
Fragility fracture: No Yes	22 (50.0%) 22 (50.0%)	41 (49.4%) 42 (50.6%)	44 (68.8%) 20 (31.2%)	0.042
Number of fractures: 0 1 More than 1	22 (50%) 16 (36.4%) 6 (13.6%)	41 (49.4%) 27 (32.5%) 15 (18.1%)	44 (68.8%) 10 (15.6%) 10 (15.6%)	0.182
Frequency of pain: < once a week 2-6 times a week Daily	9 (20.5%) 10 (22.7%) 25 (56.8%)	9 (10.8%) 37 (44.6%) 37 (44.6%)	27 (42.2%) 11 (17.2%) 26 (40.6%)	0.001
Analgesic method: OTC medicine Prescribed medicine Other technique	15 (34.1%) 25 (56.8%) 4 (9.1%)	26 (31.3%) 50 (60.2%) 5 (6.0%)	21 (32.8%) 30 (46.9%) 7 (10.9%)	0.177
Other chronic disease: No Yes	3 (6.8%) 41 (93.2%)	0 (0%) 83 (100%)	27 (42.2%) 37 (57.8%)	0.001
Number of co-morbidities: 1 2 3 or more	24 (58.5%) 12 (29.3%) 5 (12.2%)	33 (39.8%) 33 (39.8%) 17 (20.5%)	14 (37.8%) 11 (29.7%) 12 (32.4%)	0.001

Table 2. Continued.

Factor	High OP importance (n = 44)	Low OP importance (n = 83)	No OP importance (n = 64)	P ^a
Type of co-morbidity:				
High blood pressure	28 (63.6)	55 (66.3)	20 (31.3)	NA
Cardiovascular	11 (25.0)	32 (38.6)	15 (23.4)	
Other musculoskeletal	7 (15.9)	18 (21.7)	14 (21.9)	
Diabetes (any forms)	6 (13.6)	15 (18.1)	12 (18.8)	
Inflammatory bowel dis.	4 (9.1)	15 (18.1)	8 (12.5)	
Asthma, COPD	2 (4.5)	11 (13.3)	4 (6.3)	
Other diseases	6 (13.6)	12 (14.5)	9 (14.1)	
Beck depression results:				
Normal	7 (15.9%)	12 (14.5%)	9 (14.1%)	0.958
Moderate	31 (70.5%)	55 (66.3%)	47 (73.4%)	
Medium	4 (9.1%)	11 (13.3%)	5 (7.8%)	
Severe	2 (4.5%)	5 (6.0%)	3 (4.7%)	
Medication adherence:				
Low	2 (4.5%)	15 (18.1%)	8 (12.5%)	0.257
Medium	22 (50.0%)	30 (36.1%)	25 (39.1%)	
High	20 (45.5%)	38 (45.8%)	28 (43.8%)	
EQ5D Mean	0.645 (SD 0.336, SE 0.051)	0.574 (SD 0.334, SE 0.037)	0.692 (SD 0.298, SE 0.037)	0.086
EQ5D Agility				
1	22 (50%)	31 (37.3%)	32 (50%)	0.269
2	22 (50%)	50 (60.2%)	32 (50%)	
3	0 (0%)	2 (2.4%)	0 (0%)	
EQ5D Usual activities				
1	28 (63.6%)	39 (47.0%)	42 (65.6%)	0.169
2	14 (31.8%)	39 (47.0%)	21 (32.8%)	
3	2 (4.5%)	5 (6.0%)	1 (1.6%)	
EQ5D Pain and discomfort				
1	11 (25.0%)	13 (15.7%)	23 (35.9%)	0.090
2	28 (63.6%)	59 (71.1%)	35 (54.7%)	
3	5 (11.4%)	11 (13.3%)	6 (9.4%)	
VAS Mean	66.4 (SD 18.7, SE 2.8)	62.0 (SD 18.5, SE 2.0)	67.9 (SD 18.4, SE 2.3)	0.137

^{a)} 100% = patients in the given type of medication; ^{b)} Bisphosphonate; ^{c)} 100%: Other chronic diseases $\neq$ 0; ^{d)} Paired difference test was carried out between groups 1 : 2; 1 : 3 and 2 : 3

checking the clinically relevant interactions and proper use of the drug. Besides, providing all the necessary information to the patient is also a requirement. In Hungary, pharmacies get a margin for the dispensed medicines as reimbursement, and there is a so-called 'prescriptions handling fee', which compensates pharmacies for the basic pharmaceutical care service. Further pharmaceutical care interventions are supported by guidelines. The disease-specific pharmaceutical care lends pharmacies an opportunity to provide patients with a continuous, high-quality service. In order to be able to provide this service, pharmacists are required to have a specialized qualification, which is a part of their life-long learning system. Through the repetitive dispensing process, pharmacists are able to map the

patients' attitude towards their pharmaceutical therapy and their disease, and at the same time, they can assess whether the adherence of the patient is satisfactory.

In this work, three groups of patients were defined according to their feelings and ranking of their OP among the other chronic diseases they have: *High*, *Low* and *No OP importance* groups. The difference between these groups could provide information about the subjective background of patients' attitude towards their OP therapy.

There were patients who did not rank OP at all, showing that their OP is not important for them, even if they do not have any other diseases. This could suggest that it has no importance or that they can live quite well with their OP, and that is why

they do not experience the limitations and impact of the disease. Although the result is not significant, it can be stated that patients in the *No OP importance* group have a higher mean EQ5D value than the patients in the *Low OP importance* group. As a result of a better quality of life, these patients do not consider their OP important. Patients who do not have or have only one co-morbidity marked their OP highly important ($p = 0.001$). It has been found that the more chronic diseases a patient has, the lower OP is ranked. However, OP remains mainly in the third place, even if the patient has more than two other chronic diseases. The patients' proportion with no other chronic diseases and with three or more co-morbidities was found to be significantly higher in the *No OP importance* group than in the other groups of OP importance.

Based on the results, it can be stated that patients who ranked OP first are significantly older than other patients ($p = 0.023$), and patients over the age of 70 feel their disease highly important. It is proven that being older is a protective factor for nonadherence (26, 27). *High OP importance* patients have significantly lower T-scores than other patients ($p = 0.006$). Table 2 shows that patients with a higher T-score than -3 need strengthened attention. These results show that, in this study population, patients with a lower T-score feel that their disease is of more importance than it is for the other patients. The decreased value of the T-score has a negative effect on the subjective perception of the quality of life, which makes the disease more important to these patients (28).

95.4% of the *High OP importance* group consists of retired patients. In the *Low OP importance* and *No OP importance* groups, there is a significantly lower number of retired patients than in the *High OP importance* group ($p = 0.016$). This is what we expected, since active workers – as their disease status or age allows them to work – do not find their disease as important as retired patients.

Klop et al. have proven that prior fracture has a positive influence on adequate antiporotic persistence (29). Although it has been found in this study that, patients with no fracture find their disease not important ($p = 0.042$), this does not correlate with the number of fractures. It can be stated that the fracture itself draws the patients' attention to the importance of the disease, and this is not influenced by the number of fractures. Frequency of pain correlates with the importance of the disease: significantly more patients were found as ranking OP first in the group of patients who reported daily musculoskeletal pain ($p = 0.001$). A smaller proportion of patients was found with frequent pain in the *No OP importance* group.

There were no significant differences between the groups of OP importance from the point of view of time spent from the diagnosis; while a significant difference was found in taking medicine ($p = 0.005$) and type of medicine taken ($p = 0.002$). The proportion of medicine taker patients was the lowest in the *No OP importance* group. Patients on per os BP therapy ranked OP to the second, third or fourth place. 93.1% of patients of intravenous BPs reported their disease as not important (*Low* or *No*

Figure 4. Adherence status in the various osteoporosis importance groups

Figure 5. Percentage of the patients' answers (1-3) in the dimensions of EQ5D in the various groups of osteoporosis importance

OP importance). This brings up the question whether these patients were on intravenous therapy because the severity of their disease justified it, or because they were nonadherent and so by this type of drug administration, patients get the medication they needed. The latter statement could be confirmed by the findings. The proportion of patients who took antiporotics, but did not remember the name of their medicine was significantly higher in the *No OP importance* patients' group than in the other groups.

According to the results, there was no significant difference in medication adherence or the quality of life between the groups of OP importance. In the case of medication adherence, in the *High OP importance* group, there were more patients with higher adherence level. The frequent occurrence of the medium adherence patients in the *High OP importance* group might have been the result of forgetfulness. The proportion of patients with insufficient adherence was higher in the groups of *Low* and *No OP importance*, but there were no significant differences in the proportion of patients with high adherence between the groups of OP importance.

From the point of view of chronic co-morbidities, it has been found that the proportion of patients with no other chronic diseases was significantly higher in the *No OP importance* group. We can also state, that the proportion of patients with three or more other chronic diseases was also higher in the *No OP importance* group.

In this study population, no significant differences were found between the groups of OP importance in the dimensions of EQ5D. As Figure 5 shows these groups are diverse: the *Low OP importance* group gave the worst answers in all dimensions of EQ5D. This might be the result of the co-morbidities or inadequate OP therapy. Based on these results, it can be assumed that patients in the *No OP importance* group get on well with their disease: the proportion of level 2 and 3 answers of the EQ5D questionnaire were the lowest in all dimensions in this group. The *Low OP importance* group has also the worst EQ5D value results (Fig. 6). In the *No OP importance* group, it is assumed that they have the highest EQ5D results because the disease causes no problem for them. As Table 2 shows, patients with a higher impact on daily living and difficulties with their OP consider their disease highly

important. These patients have higher adherence to their therapy and report better quality of life. As a result, *High OP importance* patients have to be assured by healthcare providers that their disease is well-managed owing to the patients' correct attitude. *Low OP importance* patients' attitude towards the therapy should be changed: by highlighting the importance of OP to the patient, through raising the awareness and motivation, their quality of life might be increased.

Limitations

Data on patients' present medicine taking were only available when they filled in the set of questionnaires. The patient population is relatively small to generalize these findings to the whole Hungarian OP population.

CONCLUSIONS

Public pharmacists have the opportunity to regularly contact osteoporotic patients. They can play a special role in helping these patients by enlightening them about the scientifically proven benefits and risks of their medicines. Pharmacists should understand how patients get on with their disease and what kind of factors affect their attitude towards antiporotic therapy; which, in turn, could help them to reach optimal disease management.

With the results of this study, community pharmacists might be able to better identify specific, influential characteristics of osteoporotic patients that impact their attitude. Taking these special needs into account, pharmacists are provided with the opportunity to optimize patients' therapy manage-

ment. Since having these pieces of information will enable harmonizing patients' subjective feelings and expectations of their OP therapy.

The so-called „risks groups” with special requirements and a need for focused therapy management are as follows:

- patients with asymptomatic OP or few symptoms of OP,
- patients with no fragility fractures,
- patients with no or more than two chronic diseases existing parallel to OP,
- patients with a femoral T-score >-3 ,
- patients who do not remember the name of the antiporotic medicine,
- patients under the age of 70 and
- active workers.

Through the dispensing process of an antiporotic medicine, these risk groups should be taken into consideration by the pharmacist, if the patient's adherence is found to be unsatisfactory. Having knowledge about the patient's attitude, pharmacists could present focused information to increase the subjective importance of OP. If healthcare providers can make the patients consider their disease more important, which results in higher adherence, there is a chance that they can improve their quality of life.

Some physicians are arguing that in this so-called „crisis situation” when there are still lots of OP patients without adequate treatment, „they need help from other” healthcare professionals to prevent their nonadherent patients from the needless suffering and mortality (8, 9). Pharmacists are the healthcare professionals with an opportunity to keep con-

Figure 6. Mean EQ5D values in the groups of OP importance

tinuous contact with the osteoporotic and paraosteoporotic patients in the routine pharmacy practice. They have the capability and knowledge to improve patients' adherence and to put an end to the irrational fears of antiporotic therapies. Pharmacists need to play a more active role and should help in the prevention of OP in order to decrease the fracture risk of the population and consequently lower healthcare expenditures.

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