
GENERAL

**INFORMATION AND AWARENESS CONCERNING IBUPROFEN
AS AN INGREDIENT IN OVER THE COUNTER ANALGESICS:
A QUESTIONNAIRE-BASED SURVEY OF RESIDENTS
OF RETIREMENT COMMUNITIES**PETRA MATOULKOVÁ^{1*}, MARTIN DOSEDĚL¹, BARBORA RŮŽKOVÁ¹ and ALEŠ KUBĚNA²¹Charles University in Prague, Pharmaceutical Faculty, Department of Social and Clinical Pharmacy;
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Abstract: Convenient access to a large variety of OTC medicines presents patients with the opportunity for the self-treatment of many health problems. Yet this also brings on other health risks, especially to the elderly. A pointed lack of information about the safety of NSAIDs has been found among lay people, but no study in the Czech Republic so far has focused on the preferences of the residents' of retirement homes for particular NSAID pain relievers and these patients' level of knowledge regarding use and safety issues. We undertook a cross-sectional study in 9 retirement communities. A self-developed questionnaire was used to gather data on the preferences of seniors for particular NSAIDs and on their knowledge about ibuprofen. Two hundred elderly people participated in the research, 77% of the sample being female. The mean age was 83 ± 7 years. Ibuprofen was the preferred NSAID analgesic among participants. 64% of respondents indicated that they suffered from pain nearly every day. The best known indication of ibuprofen was analgesic (56.7%) and younger and more educated participants had better knowledge in general about indications. A similar percentage (57.8%) was not aware of any adverse effects of ibuprofen, and 16% believed it had no adverse effects at all. Knowledge of drug interaction was very low – most of participants (84%) were not aware of any interactions. 58% of respondents indicated that they relied on the advice of a physician about pain relievers. Despite the fact that many of the elderly individuals surveyed suffer from pain nearly every day and ibuprofen is their preferred choice among NSAIDs, their knowledge about use and safety of ibuprofen is inadequate.

Keywords: self-medication, seniors, knowledge, ibuprofen use and safety

The elderly (older than 65) are reported to consume 40% of the total use of non-prescription medication. It seems that in addition to prescription medicines many of them use at least one OTC drug (1). Among OTC medicines oral analgesics are popular among the elderly even they bring recognized dangers (2). A retrospective cohort study conducted in elderly Tennessee Medicaid recipients found higher rates of hospitalization for treatment for ulcers among current NSAID users than for nonusers, and this risk increased with the dose of NSAID (3). Over the counter NSAIDs were found to be the most common cause of peptic ulcer disease (the most common source of bleeding) within elderly patients admitted for selective outpatient management of upper gastrointestinal tract bleeding. The

most frequent reason (69 per cent of patients) for NSAID use was musculoskeletal pain (4).

Changes in pharmacokinetics together with polymorbidity and polypharmacy occurring in the elderly pose a higher risk of damage caused by mutual interactions as well as more pronounced adverse effects as compared to younger adults.

In the Czech Republic, ibuprofen is available both as an OTC drug and by prescription, manufactured by several pharmaceutical companies. Several strengths are available as non-prescription NSAID ibuprofen for oral administration are indicated for adults, including the elderly. The set dosages of active ingredient in these ibuprofen tablets are 200 and 400 mg. Ibuprofen suspension is intended to be administered to children. Topical ibuprofen can be

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formulated as a gel or a cream. Adult patients are recommended to take ibuprofen no more than 7 days without seeing a physician (5).

Research on non-prescription ibuprofen in Czech Republic has been conducted by Máčešková. In two studies, pharmacy clients were questioned on their medication purchasing behavior regarding OTC medicines containing ibuprofen. Most of those purchasing were repeated users. Only one third of new users of ibuprofen consulted with a physician about using ibuprofen prior to obtaining it. Another survey focused on the level of information of those who bought ibuprofen. The study demonstrated that generally 40% of those who required ibuprofen did not ask for any information regarding the medicine; their knowledge about contraindications and possible adverse effects of ibuprofen reached 28% in the group of first time users, and one half in the group of repeated users. Despite this unawareness, the majority of both groups of users indicated that they believed they had enough information. Research has not specifically addressed the perspectives of the elderly (6, 7).

Two studies addressed the state of knowledge of lay people about NSAIDs: one about NSAIDs in general (8) and the other specifically about ibuprofen (9). No previous study has specifically addressed knowledge about non-prescription ibuprofen of elderly living in retirement homes. Therefore, the aim of our study was to survey preferences of the residents of retirement communities in regard to available over-the-counter NSAIDs, as well as to determine their knowledge about the indications, contraindications, drug-interactions, adverse effects of non-prescription ibuprofen, including their sources of information about ibuprofen use and safety issues.

EXPERIMENTAL

We undertook a cross-sectional study in the Liberecky region and Central Bohemia region, Czech Republic. The total number of inhabitants of the Liberecky region was 439,027 in 2010, and in the year of the survey there were 16 retirement communities in the region. The population of Central Bohemia at the time was 1,247,533 and 63 retirement homes were located in the region (10-12). We asked managers of all the facilities in the Liberecky region to join the project and 7 were willing to cooperate. To ensure a sufficient number of respondents an additional 2 homes from the Central Bohemia Region, located very near to the Liberecky region, were asked to participate.

Each of the surveyed retirement communities has from 65 to 200 beds and serves as a long term living facility for people over 60 years of age, some of whom are also physically handicapped. The attending nurse in the participating facilities approached the residents without cognitive deficit who were willing to join the research and asked them to complete the questionnaire. The study was conducted from April to August 2010. As a way of examining the attitudes of those in the cohort about ibuprofen and self-treatment, the questionnaire was developed to be either self-administered or used in a face-to-face structured interview conducted by one researcher (B.R.). The questionnaire consisted of 19 questions in three sections – sociodemographic and economic data (age, gender, education, income, and former residence - the size of the municipality where residents had lived prior to their relocation to the retirement home), information on pain frequency and localization and pain behavior and knowledge about ibuprofen (about the adverse effects of ibuprofen, drug interaction, indication, contraindications and sources of information). There were 7 closed questions and 11 questions were closed with an option of additional comments. One question was open and dealt with age. We did not ask about residents' experience with ADRs of ibuprofen.

The questionnaire provided several possible responses and the participants were allowed to choose as many as they wished. In a pilot study the comprehensibility of the questionnaire was assessed.

Data analysis

Descriptive data (mean and standard deviation) were used to provide a quick summary of the metric variables. Ordinal data (education, knowledge) were analyzed using a non-parametric test (Kendall regression). Appropriate Kendall's τ coefficients ($\tau \in <-1.1>$) are presented for correlation. There were no statistically significant differences between the two studied regions in answers, thus results are presented in a combined sample.

RESULTS

Respondent's characteristics

Two hundred residents agreed to participate. The percentage of respondents in relation to the total number of residents of each participating retirement home ranged from 5 to 16%. Most (77%) of the sample was female. The mean age was 83 ± 7 years (range 60 to 98 years). The other sample characteristics are summarized in Table 1.

Table 1. Socio-demographic and economic characteristics of study participants.

Characteristic	n (%)
Age (years)	
60-70	(4.5)
71-80	(26)
81-90	(59.5)
> 90	(10)
Gender:	
Female	154 (77)
Male	46 (23)
Education:	
Basic	100 (50)
Secondary without GCSE ¹	57 (28.5)
Secondary with GCSE	38 (19)
University degree	5 (2.5)
Size of municipality (No. of inhabitants) ²	
< 4,999	80 (40.2)
5,000-9,999	20 (10.1)
10,000-49,999	30 (15.1)
50,000-99,999	15 (7.5)
100,000-999,999	25 (12.6)
> 1,000,000	5 (2.5)
Income (€)	
< 199	9 (5)
200-399	68 (34)
400-600	48 (24)
no response	74 (36)

¹ The General Certificate of Secondary Education (GCSE). ² Size of municipality where a respondent had lived before relocating to retirement community.

Table 2. Self-reported pain frequency.

Self-reported pain frequency	n (%)
Never	15 (7.5)
Once a month or less	15 (7.5)
Several times a month	21 (10.6)
Weekly	20 (10.1)
Nearly daily	128 (64.3)

Self-reported frequency and self-treatment of pain

Sixty-four per cent (128/200) of respondents stated they suffered from pain nearly every day. Only 7.5% (15/200) almost never experienced pain

(Table 2). The muscles and joints were the most common site of pain (34%; 68/200), followed by back and lower back pain (29%; 58/200) and headache (14%; 28/200). When asked how they manage pain ("What do you do when you suffer from pain?") 55% (110/200) of respondents stated they had seen a doctor and were prescribed a medicine. The other 19% (38/200) reported they had been purchasing medicine from a pharmacy on their own. Regarding the active ingredient in the pain medication used, participants in the survey preferred medicines containing ibuprofen (35.6%), followed by acetaminophen (30%) and aspirin (8.3%). Nearly 10% of the interviewers reported using medicines available only by prescription. Topical drugs containing non-steroidal analgesics were used only by 1.9% of those who completed the questionnaire.

Knowledge about ibuprofen

Ibuprofen was considered mainly as a pain killer (56.7%); only a minority of respondents were aware of the use of ibuprofen as a treatment for inflammation and fever (7.3 and 5.2%, respectively). Two percent of participants believed that ibuprofen was a sleeping aid, whereas 31% of participants had no knowledge about the indications of ibuprofen. There was a positive correlation between the level of information about the indications of ibuprofen and level of higher education ($\tau = 0.220$; $p = 0.001$). Similarly, younger participants had better knowledge about the indications of ibuprofen ($\tau = -0.142$; $p = 0.012$).

The participants' knowledge of the side effects and interactions of ibuprofen was generally poor. Most of them (57.8%) reported they did not know about the adverse effects of ibuprofen, more than 16% of the subjects answered that ibuprofen had no adverse effects and only 9% knew about serious side-effects. Older subjects considered the side-effects to be less serious than did the younger participants ($\tau = -0.207$; $p = 0.017$). Most of the study participants (88.9%) did not know any specific adverse effect of ibuprofen. Only 11.1% reported a particular side effect (generally "involving the stomach" or ulcers). Similarly, inadequate knowledge about ibuprofen drug interactions was identified. Most (84%) of the survey subjects did not know of any such interaction. The interactions that were mentioned involved "blood thinners" and "high blood pressure medicines".

Sources of information about OTC in general and ibuprofen specifically

When purchasing over-the-counter (OTC) medicines in the pharmacy, participants reported they relied mainly on a physician's recommendation (58%). Thirteen percent of respondents said they turned to the pharmacist for advice about OTC medicines; 10% sought information from a nurse. More than forty percent of participants (43%) also believed that a physician was an important source of information regarding the use of OTC medicines. Another common source of information was patient information leaflets (27%), and seeking advice from a pharmacist was reported less often (13%). The participants' gender was a statistically significant factor in deciding on OTC medicines. Men preferred pharmacists' counselling about OTC medicines, while women did not ($p = 0.01$). We found no other significant influences of socio-economic/demographic factors (age, gender, education, income) on the results. The majority (32.7%) of survey participants

sought information regarding adverse effects and contraindications of ibuprofen from their physicians. The next two most frequent sources of information were found to be nurses serving a particular retirement facility (17.8%) and patient information leaflets (12.1%). Pharmacists as a source of information were mentioned only by 5.1% of respondents.

DISCUSSION AND CONCLUSION

We suggest that most elderly people living in retirement homes in the Czech Republic suffer very often with pain (64% reported daily pain experience). When deciding whether to purchase an OTC medicine they generally rely on a physician's recommendation, and likewise, they consider physicians to be the best source of information regarding adverse effects and contraindications. To alleviate pain they preferred ibuprofen and acetaminophen/paracetamol orally to other possible substances or medicine forms. In the case of ibuprofen, however, they themselves had limited knowledge about indications, potential adverse effects, drug interactions and contraindications of this substance. Younger and higher educated patients were better informed about indications than older and less educated individuals. In contrast to younger respondents, older residents considered adverse effects to be more severe.

Our data are in accordance with other pain prevalence studies. Mobily et al. in the Iowa 65+ Rural Health Study reported that 86% of the 3,097 older people surveyed had suffered from some type of pain in the previous year (13). Reported pain prevalence in the institutional settings for the elderly with chronic health problems ranged between 70-83%, reflecting pain mostly affecting back and joints (14). The incidence of chronic pain conditions of an acute nature seems to be comparable in all age groups. The occurrence of chronic pain increases at age 70 and thereafter remains unchanged. Older people reported pain more often in their joints, legs and back in contrast to headache or visceral pain (15). Similarly, according to a study on different aspects of chronic pain conducted in 2003 in 15 European countries and Israel, it seems that those between 41-60 years of age suffered from chronic pain more often than other age groups. This study did not test residents of the Czech Republic (16).

We have no previous data from the Czech Republic concerning the incidence of pain and its management in institutionalized individuals. Malek et al. in a previous study has shown a 20% preva-

lence of chronic pain in the Czech population (17). A study by Ngo et al. (9) surveyed knowledge about ibuprofen among pharmacy clients in Australia. Indeed the study population was different from ours (mostly females younger than 50 years of age). Of these respondents, the majority did not provide exact answers about the indications of ibuprofen, and most of them reported not to read patient information leaflets regarding potential adverse effects (9). Similarly, a lack of knowledge about proper NSAID use and knowledge about adverse effects was reported among pharmacy clients purchasing NSAIDs in Jordan (8.).

Elderly patients are usually polymorbid and are treated with on average 6-9 prescription medicines (1). For this group of people self treatment of pain with NSAIDs like ibuprofen is risky because of physiologic and pathologic changes occurring in old age; the risk of adverse reactions rises in the elderly (18). The risk of bleeding is further increased if the patients are being treated with other medicines like corticosteroids, antiagregants (low-dosage aspirin), anticoagulants and selective serotonin reuptake inhibitors. NSAIDs may increase the risk of kidney failure or fluid overload in patients with underlying renal impairment, congestive heart failure, ascites due to cirrhosis and in those taking angiotensin-converting enzyme inhibitors or diuretic medications (1, 19, 20).

The survey showed that approximately one-half of participants suffering from pain obtained pain relieving medication from a pharmacy or an attendant nurse within a particular retirement community. Hence, both the nurse and the dispensing pharmacist should take all factors into consideration when recommending OTC pain medicines for the elderly. Paracetamol and ibuprofen were the most commonly used OTC pain medicines by the elderly in our sample, but participants in our survey did not realize the anti-inflammatory effects of ibuprofen. Likewise, most of them were not aware of the adverse effects of the substance. Batty et al. (21) surveyed 138 hospitalized patients aged 65 and older in order to determine OTC use in the year preceding admission to hospital. Forty four of the patients used OTC medicines and 23% of them used analgesics. The authors stated that very few patients read product information leaflets or were familiar with the adverse effects of the OTC medicines they used (21). Lack of knowledge about OTC medications used by older individuals was also reported by Vicki (22). McElnay and McCallion (2) mentioned that despite the fact that analgesics were commonly purchased by the elderly, only half of the respondents consulted with GP's about how the drug

should be used or even whether it should be used at all.

As for our study, several limitations should be noted. The first concerns the generalization of results. The study took place only in one part of the Czech Republic, namely the Liberecky region, which was within reachable distance for the interviewer. According to the Czech Statistical Office, the HDIH (mean net disposable income of households) per capita was 7059 /year (HDIH in Czech Republic ranged from 6694 to 9734 /year), while Czech average net worth was 7423 /year (23). The region surveyed has the second lowest population according to mid-year population statistics (24). Two other facilities included in our research were located right across the border of the neighbouring Liberecky region.

Another limitation relates to the duration of pain, which was not ascertained during the survey. So we were not able to distinguish between acute and chronic pain in our sample. We assume that most respondents suffering from pain were chronic pain patients. Self-reporting was used to ascertain pain presence; pain scales were not used to evaluate the perception of pain severity. Self-reporting has been used in many papers in determining the prevalence of pain, including Breivik et al. (16). We did not detect how many former health care workers or others with formal health care education were within the sample (which could have distorted the results), but, as knowledge about pain-relieving medication was generally very low, we suppose it had not been influenced by previous education.

Our data support previous results indicating that the level of general population's knowledge about OTC drugs is low. Participants in the research generally saw ibuprofen as a medicine free of any drug related danger. This group of people requires careful pharmaceutical care regarding possible duplication, drug interactions, adverse effects and contraindications.

Acknowledgment

The research was supported by the SVV 265 005.

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Received: 14. 02. 2012