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ORIGINAL RESEARCH ARTICLE

Older People's Preferences for Side Effects Associated with Antimuscarinic Treatments of Overactive Bladder: A Discrete-Choice Experiment

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Abstract

Introduction Understanding the importance older people attribute to the different side effects associated with oral antimuscarinic treatments for overactive bladder (OAB) could help inform prescribers, healthcare policy makers and the drug industry.

Objective Our objective was to quantify the importance of the most prevalent cognitive and side effects of oral antimuscarinic treatments for OAB in older people.

Methods We conducted a discrete-choice experiment (DCE) with the assistance of an interviewer with community-dwelling and hospitalized older people aged >65 years. The DCE involved two hypothetical drugs for imaginary OAB, with three levels of four side effects for each drug, and the International Consultation on Incontinence Questionnaire–Overactive Bladder and EuroQol 5-Dimensions (EQ-5D) questionnaire were also administered. Data were analysed using a conditional logit model.

Results In total, 276 older people participated in the study. The median age was 75 years (interquartile range [IQR] 69–80), 63% were women and 21% had OAB syndrome. The most unwanted side effect in the choice of antimuscarinics for OAB was severe cognitive effects, followed by severe constipation, severe blurred vision, severe dry mouth, moderate cognitive effects and moderate constipation. Severe cognitive effects were at least 1.7 times as important as severe constipation. Exploratory subgroup analysis showed that none of the attributes was found to be significant in people who scored as anxious or depressed on the EQ-5D, and preferences about cognitive effects, constipation and blurred vision were equal in people with and without OAB.

Conclusion Older people attribute more importance to loss of cognitive function as a possible side effect of antimuscarinic treatment than to the three most prevalent possible side effects of this treatment.

Key Points

When facing antimuscarinic treatment for overactive bladder, older people were most concerned by cognitive side effects, followed by constipation, blurred vision and dry mouth.

Insights into the side effects to which older people attach more or less importance is likely informative for prescribers and helpful in their communication with older people who would likely benefit from antimuscarinic treatment for overactive bladder.

Older people who scored as anxious or depressed on the EuroQol 5-Dimensions questionnaire were not able to make consistent choices in this discrete-choice experiment.

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1 Introduction

The prevalence of overactive bladder (OAB) in adults is high in both women (13–17%) and men (10–11%) and has been found to be higher across older age groups in both sexes [1, 2]. Prevalence in women and men aged ≥70 years reaches 21 and 16%, respectively [2].

The OAB syndrome consists of various lower urinary tract symptoms (LUTS) such as urgency, which is the most bothersome LUTS, and urgency urinary incontinence, for which the highest burden has been described [3]. The International Continence Society states that "urgency, with or without urge incontinence, usually with frequency and nocturia, can be described as the overactive bladder syndrome, urge syndrome or urgency-frequency syndrome. These terms can be used if there is no proven infection or other obvious pathology" [4]. OAB has a known negative impact on mental health and health-related quality of life in older people [5].

Depending on their health status, older people with OAB can benefit from behavioural and conservative interventions and pharmacological or surgical treatment [6]. Antimuscarinics are the cornerstone of treatment for urgency urinary incontinence and are effective in older patients [7].

The main mechanism of action of antimuscarinics is blockade of muscarinic receptors, which can be classified into five subtypes: M1, M2, M3, M4 and M5 [8]. Antimuscarinic agents differ in their affinity for these subtypes, which is reflected in different side effect profiles. Organ selectivity has been shown to be another component in the onset and severity of side effects in both in vitro and animal studies.

The most reported side effects are dry mouth, constipation and blurred or abnormal vision [9]. A recent systematic review and meta-analysis evaluated side effects in older people receiving antimuscarinics for OAB. People taking antimuscarinics had 1.26 times the risk of any side effect compared with those taking placebo. Risk ratios for constipation, dry mouth and blurred vision were, respectively, 2.39 (95% confidence interval [CI] 1.76–3.23), 3.94 (95% CI 2.82–5.50) and 0.39 (95% CI 0.04–3.71) [10].

A systematic review showed that side effects of the central nervous system (CNS), such as cognitive impairment, acute confusion, somnolence, sedation, dizziness, drowsiness, asthenia, insomnia and vertigo, were not measured or reported in 77% of the clinical trials in people with OAB. Risk ratios for developing cognitive side effects or prevalence rates are not available, partially explained by the inadequacy of clinical trials to screen for, measure and document CNS symptoms [11]. Oxybutynin and tolterodine have proven cognitive side effects [12]. European Association of Urology guidelines on urinary incontinence state that "solifenacin, darifenacin and fesoterodine have been shown not to cause increased cognitive dysfunction in elderly people" [7]. However, it is known that greater cumulative use of anticholinergics (including bladder antimuscarinics such as oxybutynin) is associated with an increased risk for a clinical diagnosis of mild cognitive impairment or dementia [13].

Quality of care for older people is characterized by the extent to which it meets the needs and preferences of the older patient [14]. Prescribers of antimuscarinics for OAB face on a daily basis a dilemma about how much information on side effects to provide to their patients. Three-quarters of people aged >65 years want to be informed of all possible side effects of their drugs, no matter the prevalence [15].

Preferences of patients and physicians with respect to the use of antimuscarinics for OAB have already been examined in two studies; however, the majority of patients with OAB in both studies were aged <65 years [16, 17]. In the first study, 18 choice sets with attributes relating to drug efficacy and side effects were presented to 332 patients with OAB. The study found that patients placed more importance on the reduction in symptoms than on the presence of drug side effects in the following order: incontinence, urgency, frequency, constipation and dry mouth [16]. The second, more recent, study was conducted in patients with OAB ($n = 442$, mean age ± standard deviation 50.1 years ± 15.1) and physicians ($n = 318$) in five European countries and addressed both efficacy and safety aspects of side effects. Their evaluations of side effects were fairly insensitive to the risk levels presented, except for dry mouth [17].

Participants in both studies were relatively young. Evidence about older people's preferences regarding the side effects of bladder antimuscarinics is absent even though they constitute a dominant target group for these drugs. Therefore, discrete-choice experiments (DCEs) are an excellent design with which to identify their needs and preferences [18].

In clinical practice, we observe that patients attach great importance to the preservation of cognition and are very often reluctant to use anticholinergics after receiving from the prescriber an explanation about the possible influences on cognition. To the authors' knowledge, no study investigating the importance of cognitive side effects to older people in the antimuscarinic treatment of OAB has been presented to date.

The aim of this study was to quantify the importance attributed by older people to the most prevalent side effects (dry mouth, constipation and blurred vision) as well as to cognitive effects of oral antimuscarinics for the treatment of OAB, by asking community-dwelling and hospitalized older people to make discrete choices.

2 Methods

This study used a DCE to elicit preferences from older people. The DCE is a methodology to quantify individual preferences that originated in mathematical psychology and has been used in marketing. Series of hypothetical choice sets are presented to the individual. In each set, a preference choice must be made between two or more alternatives. Those alternatives have a few attributes with different levels. In DCEs, the respondent's choice is modelled as a function of the attribute levels. Statistical analysis of the different choices discloses the importance of the attribute levels and the trade-offs between attribute levels the individual is willing to make. The design, administration and analysis of this study were based on reports from the International Society for Pharmacoeconomics and Outcomes Research [19–21].

2.1 Attributes and Levels

The most frequently experienced side effects (attributes) of antimuscarinic agents in the treatment of OAB in older people were identified by means of a literature review [9, 22, 23]. Three attributes were selected because of their high incidence in patients taking antimuscarinics: dry mouth, constipation and blurred vision. Cognitive effects were added as the fourth attribute because of the importance people attribute to cognition [24]. Other side effects (itching, erythema, fatigue, increased sweating and urinary retention) were excluded to minimize the complexity of the DCE task. Moreover, adding more attributes would improve cognitive burden, reduce choice consistency, decrease response rate [25] and imply a larger study population, which is not feasible in face-to-face interviews. Drug efficacy and costs were constant in every profile.

The levels of these attributes were chosen to indicate the severity of the side effects: none, moderate and severe. Side effects that are present but do not affect daily living were rated as moderate, whereas those that affect activities of daily living were rated as severe. Risk levels of side effects were not included. Recent research showed people find it difficult to differentiate between low-level risks and assess the presence rather than the level of a risk [17, 26].

The attributes and their levels are described in lay language in the Electronic Supplementary Material (ESM) 1.

2.2 Construction of Tasks and Experimental Design

Drug side effect profiles were set up for the questionnaire, not necessarily representing real-life profiles. These hypothetical drug side effect profiles were the combination of attributes and their levels, resulting in a full factorial design of 81 profiles (four attributes with three levels $= 3^4$). Each choice task consists of two profiles.

An opt-out option was not offered, meaning participants did not have the option of not choosing a drug at all. The aim of this study was to evaluate the perceived importance of side effects and not the willingness to take medication.

Nine choice sets were created using the SAS macros for experimental design and choice modelling [27]. The full-factorial design was used as starting point. The algorithm then determined the candidate profiles of a specified maximal size for an efficient experimental design, i.e. a design in which the variances of the parameter estimates are minimized.

Research [28] about the potential impact of cognitive functioning on DCEs with older people in healthcare showed that mild cognitive impairment did not significantly affect the consistency of responses. In that study, the complexity of the DCE was simplified by limiting the number of attributes (four) and levels (three) and by reducing the number of choice sets (six), making them more adapted to people with mild cognitive impairment [28]. We included only four attributes and three levels. In healthcare research, there is still no consensus about the appropriate number of choice sets a participant can complete, but it is good practice to include 8–16 sets [19]. In our study, nine choice sets were created.

2.3 Preference Elicitation and Instrument Design

Participants were asked to imagine suffering from complaints of OAB (frequency, urgency, nocturia and urgency incontinence), having visited a physician and having been proposed two different oral drugs. Cost effectiveness was the same for both drugs. Respondents were then asked to choose one of the two hypothetical drugs for the treatment of OAB, both of which were defined by the attributes and levels of hypothetical drug side effects (ESM 2).

An example of a treatment–choice question is shown in Fig. 1, and all questions are available in ESM 3.

Furthermore, two additional questionnaires were administered to characterize the participants: present health status was assessed using the EuroQol 5-Dimensions questionnaire (EQ-5D) and the International Consultation on Incontinence modular Questionnaire for Overactive Bladder (ICIQ-OAB).

The EQ-5D is a standardized instrument used to measure and value health outcomes in five domains: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Each domain can be scored into three levels: no problems, some problems and severe problems. The EQ-

	Drug A	Drug B
Dry mouth	None	Severe
Constipation	Moderate	None
Blurred vision	None	Moderate
Cognitive effects	Severe	Moderate
Which drug do you prefer?	☐	☐

Fig. 1 Example of a discrete-choice experiment question

5D health profile can be converted into a single index value. The values range from 1 (perfect health) to 0 (death). Negative values are possible where the health status is considered worse than death [29].

LUTS associated with OAB were assessed using the ICIQ-OAB: daytime frequency, nocturia, urgency and urgency incontinence [30].

No a formal pilot study was conducted, but the researcher used an interview mode of administration in the first ten hospitalized participants. After the subject completed the questionnaires, they participated in an informal discussion about their perception of the questionnaires. The survey length and complexity was considered appropriate by these participants, and no misunderstandings were observed by the researcher.

2.4 Data Collection

This DCE was conducted between October 2015 and May 2016. The study population included a convenience sample of community-dwelling and hospitalized older people (aged ≥65 years). This convenience sample included people with and without complaints of OAB. The choices of people in each group may vary depending on their experience with the treatment of OAB. In this study, we identified participants with and without complaints of OAB, but we did not collect data about treatment.

We applied the formula for aggregate-level full-profile choice-based conjoint analysis recommended in marketing research: $(N \cdot C \cdot A)/L \geq 500$, where N is the number of respondents, C is the number of choice sets, A is the number of alternatives and L is the number of levels [31]. According to this formula, the minimum number of respondents in this study is 84.

The community-dwelling older people were visited by student nurses in the context of an interview task within their bachelor training. The DCE was administered at the end of their interview. The hospitalized older people were recruited in a university hospital by a study nurse. Both student nurses and the study nurse were trained in obtaining informed consent as well as in conducting questionnaires and the DCE. Inclusion criteria were community-dwelling or hospitalized older people (aged >65 years). Exclusion criteria were (pre)terminal state of life and without the ability to maintain a coherent conversation. We asked the nurses delivering integrated care in the hospitalized population whether the eligible older patients met the inclusion criteria and whether it was appropriate for a study nurse to visit them while in a stable condition (e.g. no study visit after disclosing unfavourable information to the patient, before invasive procedures or during early postoperative period).

Participants were not cognitively assessed prior to the DCE. They were free to choose the mode of questionnaire administration: self-administered or interview mode while being shown the questionnaires at the time of participant's consideration.

Local ethics committee approval was obtained for this study (2015/0421), and informed consent was obtained from all individual participants included in the study.

2.5 Statistical Analysis

Characteristics about age and sex of the respondents were reported. Age groups were defined as old (aged 65–79 years) and oldest-old (aged ≥80 years).

For statistical analysis, an OAB symptom was considered to be present when the score was 'sometimes', 'most' or 'all of the time' (score ≥2), except for daytime frequency and nocturia, where the voiding frequency was used.

To define OAB in this population, the following answers were used:

- Daytime frequency: seven or more times during the day.
- Nocturia: two or more times during the night.
- Urgency: sometimes, most or all of the time.
- Urgency incontinence: sometimes, most or all of the time.

The following symptom combinations, derived from the method used in a prevalence study [2], were used to indicate a person with possible complaints of OAB:

OAB: urgency + daytime frequency (±urgency incontinence);
urgency + nocturia (±urgency incontinence);
urgency + daytime frequency + nocturia (±urgency incontinence);
urgency + urgency incontinence.

SPSS Statistics v.23.0 (IBM Corp., Armonk, NY, USA) was used for data analysis of the EQ-5D and ICIQ-OAB responses. Missing values in questionnaires were not replaced. The data from the DCEs were analysed with the statistical programming language R (R Core Team, Vienna, Austria). A conditional logit model was used to estimate the size of the effects of each of the symptoms and the severities. The dependent variable is the option chosen by the respondent; the independent variables are the corresponding dummy-coded and differenced (with regard to the alternatives) side effects (dry mouth, visus, …). The reference category for the dummy coding is the absence of the side effect. The regression coefficients in this model give an estimate of the like or dislike for the various symptoms and severities under investigation. For example, a negative beta coefficient means that the presence of that attribute level decreases, ceteris paribus, the probability of the option being chosen. The absolute value of the beta coefficients relates to the magnitude of the decrease/increase of that probability. A higher absolute value means a stronger effect of that attribute level. More specifically, the coefficients obtained from the logit model provide an estimate of the (log) odds ratios of preference for treatment attributes.

The quality of responses was assessed by including a rationality test to assess each participant's understanding of the questionnaire. This test consisted of an additional choice set in which one drug had lower severity for all OAB symptoms compared with the other drug in the choice set (ESM 1, choice set 2).

3 Results

3.1 Breakdown of Participants

Written informed consent was received from 304 older people; 25 were excluded from analysis because of incomplete questionnaires (missing data because of presence of urinary catheter [$n = 2$], uro-ostomy [$n = 2$], dialysis [$n = 1$] or other [$n = 6$]), discontinued participation by the participant during the survey ($n = 3$) or by the investigator because of suspected cognitive problems ($n = 11$).

Three participants (community-dwelling: $n = 2$, hospitalized: $n = 1$) were excluded because they did not pass the rationality test. This resulted in a dataset of 276 older people.

3.2 Participants' Characteristics

The majority of the participants were women ($n = 175$ [63%]), and the median age was 75 years (interquartile range [IQR] 69–80). Among all participants, 71 people (26%) were in the oldest-old age group (54 [76%] women, 17 [24%] men).

Table 1 presents a comparison of the participant characteristics between community-dwelling and hospitalized older people. Both groups were similar in terms of age, sex and OAB. The EQ-5D index was narrowly similar ($p = 0.051$), but there were statistically significant differences in the dimensions. Hospitalized people had more problems with usual activities and anxiety/depression than did community-dwelling older people.

According to the ICIQ-OAB, 57 (21%) participants suffered from OAB syndrome. No statistically significant difference in the prevalence of OAB was found by sex (42 [24%] women, 15 [15%] men) and age ($n_{old} = 40$ [20%], $n_{oldest\ old} = 17$ [24%]).

Health-related utility scores were lower in females, the oldest-old and people with OAB than in males, the old and people without OAB, respectively.

3.3 Discrete-Choice Experiment

Six attribute levels, except moderate dry mouth and moderate blurred vision, were statistically significant in the total study population, meaning that all these attributes and corresponding severity were determinants of choice of the respondents. Participants exhibited negative preferences for all attribute levels, indicating that they do not prefer a drug treatment with more of those attributes, assuming the other characteristics are equal. The side effects with 'moderate' severity had lower coefficients than 'serious' severity.

Figure 2 shows that severe cognitive effects is the most unwanted side effect in the choice of oral antimuscarinic treatment for OAB, followed by severe constipation, severe blurred vision, severe dry mouth, moderate cognitive effects and moderate constipation. Severe cognitive effects were at least 1.7 times as important as the second most important determinant (severe constipation).

We also conducted an exploratory analysis with a conditional logit model of subgroups based on sex, age group, OAB, residence and the five domains of the EQ-5D. For each of those subgroups, the strong effect of severe cognitive effects, severe constipation and severe blurred vision

Table 1 Participants' characteristics and prevalence of overactive bladder symptoms according to the International Consultation on Incontinence modular Questionnaire for Overactive Bladder in all, community-dwelling and hospitalized older people

Variable	All ($n = 276$)	Community-dwelling subjects ($n = 129$)	Hospitalized subjects ($n = 147$)	p value
Participant characteristics				
Age, years, median (IQR)	75 (69–80)	75 (70–80)	75 (69–80)	0.787
Sex, M/F (%F)	101/175 (63)	40/89 (69)	61/86 (59)	0.080
EQ-5D[a] index, median (IQR)	0.7444 (0.6127–1)	0.7641 (0.6589–1)	0.7333 (0.5565–1)	0.051
EQ-5D per item, no problems/problems (% problems)				
Mobility	181/95 (34)	88/41 (32)	93/54 (37)	0.446
Self-care	212/64 (23)	106/23 (18)	106/41 (28)	0.063
Usual activities	161/115 (42)	91/38 (30)	70/77 (52)	<0.001*
Pain/discomfort	123/153 (55)	51/78 (61)	72/75 (51)	0.145
Anxiety/depression	224/52 (19)	112/17 (13)	112/35 (24)	0.030*
ICIQ-OAB, n (%)[b]				
Nocturia	125 (45)	54 (42)	71 (48)	0.332
Urgency	64 (23)	29 (23)	35 (24)	0.886
Daytime frequency	71 (26)	39 (30)	32 (22)	0.129
Urge urinary incontinence	35 (13)	17 (13)	18 (12)	0.857
OAB syndrome, n (%)[c]	57 (21)	26 (20)	31 (21)	0.882

EQ-5D EuroQol 5-Dimensions questionnaire, *F* female, *ICIQ-OAB* International Consultation on Incontinence modular Questionnaire for Overactive Bladder, *IQR* interquartile range, *M* male, *OAB* overactive bladder

* $p < 0.05$

[a] EQ-5D is scored −0.59 to 1.0; −0.59 represents a state worse than death and 1.0 the best possible health. Each item is scored 1–3; 1 = no problems, 2 = moderate problems, 3 = extreme problems

[b] Presence of the symptom is indicated by a prevalence score 'sometimes', 'most' or 'all of the time', with the exception of daytime frequency (≥7) and nocturia (≥2)

[c] OAB syndrome cf. following symptom combinations: urgency + daytime frequency (± urgency incontinence); urgency + nocturia (± urgency incontinence); urgency + daytime frequency + nocturia (± urgency incontinence); urgency + urgency incontinence

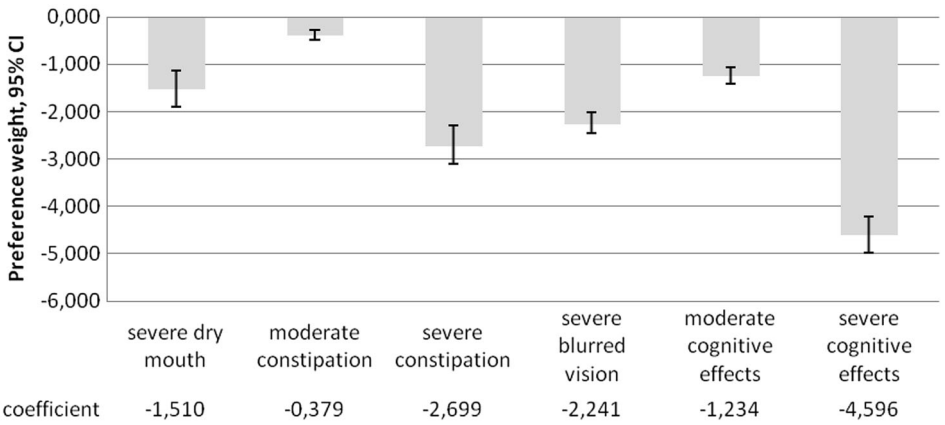

Fig. 2 Mean preference weights for the total study population ($n = 276$). *CI* confidence interval

was similar to the results of the overall group. Although people categorized as anxious or depressed on the EQ-5D ($n = 52$) passed the rationality test, those participants were unable to make consistent choices in the other choice tasks, meaning none of the attributes was found to be significant for this subgroup.

4 Discussion

To the best of our knowledge, this is the first study to examine the relative importance attributed by older people to different possible side effects of antimuscarinic therapy in OAB. The prevalence of OAB is higher across older age

groups, but few studies focus on the opinion of older people. In this study, cognitive side effects were the most important consideration for therapy choice, followed by constipation, blurred vision and dry mouth. In our findings, cognitive side effects were at least 1.7 times as important as constipation. Our results suggest that preservation of cognition is a very determining factor in the decision-making process of older people and in clinical drug development [24, 32].

Our quantitative data presented here need to be supported by qualitative data using focus groups. This would make it possible to analyse why participants experience cognitive side effects as more important than constipation, blurred vision and dry mouth. We hypothesize several reasons, wherein only the last one is supported by literature, for the importance of cognitive effects: (1) belief in the treatability of constipation, blurred vision and dry mouth in contrast to cognitive effects, (2) older people's experience with the effects of cognitive impairment in relatives or friends and (3) fear of important unacceptable changes in personality [33]. The fact that side effects such as mild to moderate dry mouth, constipation and blurred vision are mainly accepted by older patients with OAB if they are effectively alleviated might support our first hypothesis [34].

The use of DCE in healthcare has been growing in recent years, but DCE studies within populations of older people remain sparse [18, 35]. Although reliability and validity studies of DCE in older populations are still needed, findings from our study are positive. The majority of our participants who indicated having no problems with anxiety or depression on the EQ-5D seemed to make reliable choices, meaning that there were statistically significant negative preferences for side effect coefficients, and attributes with severe impact scored more unlikely than attributes with moderate impact. A brief report was previously published about the potential impact of cognitive functioning in DCE with older people in healthcare [28]. In this study, mild cognitive impairment did not have an effect on the consistency of responses. A recent interview study on how individuals complete choice tasks in a DCE concluded that the majority of participants understand provided information about choice tasks, attributes and levels and uses complex decision strategies [36]. Although more educated and literate people appear to include three or more attributes and they trade-off more often between attributes than do less educated and less literate participants, it was remarked that, based on participants' age, educational level and health literacy, additional actions should be undertaken to ensure that participants understand the DCE. To meet the needs of less educated or less literate participants or those with mild cognitive impairment, we simplified this DCE by limiting the number of attributes, levels and choice sets and offered them the opportunity for help from a study nurse or a student nurse who could explain the task and answer questions.

An unexpected finding was that the preferences of all subgroups followed the same pattern, except in older people who stated having problems with anxiety or depression. Those respondents made very different choices, resulting in no preference for any side effect. An explanation could be that they did not understand or were not focused on the choice task. However, given the small subgroup, this subgroup analysis is exploratory rather than confirmatory and should be considered as a hypothesis-generation exercise for other DCE in healthcare.

4.1 Clinical Significance

Patients and physicians consider several factors when selecting between different options for pharmacological treatment of OAB. Our results suggest that not all side effects were perceived as equally adverse; apart from the unknown effect of the probability of developing of these side effects, cognitive effects were the most important attribute in this study.

The finding that older people attribute considerable importance to this side effect is an additional reason for further research into the prevalence of cognitive side effects of the different bladder antimuscarinics, to allow prescribers to correctly inform patients with respect to the risk of cognitive side effects.

Given that older people definitely want to avoid this side effect, it is also very important that the prescriber correctly informs relatives of the patient regarding the side effect. Indeed, very often the patient does not notice any changes with respect to cognition [37].

4.2 Strengths

The sample size was considerable, and an interviewer (nurse student or study nurse) was present to answer questions about the questionnaires and tick the respondent's answers when needed. In older and/or less health literate people, the presence of a researcher is helpful to explain how to complete a DCE and to answer questions [36]. We believe the presence of an interviewer was appropriate in this study. However, it is possible that people did not want to share information about their health in the EQ-5D and even more likely in the ICIQ-OAB. Nevertheless, the prevalence of OAB in this study population is similar to the prevalence in the community, although the proportion of older women (63%) in this study is not perfectly comparable to the relative proportion of older women (57%) in Belgium [38].

4.3 Limitations

This DCE had some limitations to its ability to elicit preferences from older people for side effects of antimuscarinic treatment of OAB.

First, only the four selected side effects were investigated. Other side effects (attributes) might exist, and relevant motives such as prevalence, reversibility and treatability (levels) of the side effects were not directly included. The most important limitation is the absence of risk information about the side effects. Furthermore, the extents to which older people are willing to forego efficacy and personal monetary cost were not tested. Adding these attributes and levels could change results because people may select a drug with a higher probability for side effects that is less expensive. The main motivation for this limited set of attributes was to avoid a highly complex and long DCE at the expense of considering a more realistic scenario.

Second, we did not formally assess cognition, educational level or health literacy of participants. On the other hand, each participant had the opportunity to get help from a student nurse or study nurse.

Third, our study population, though certainly not an OAB group, did include a significant number ($n = 57$ of a total study population of 276) of participants suffering from OAB symptoms that were identified via the ICIQ OAB. This subpopulation of participants suffering from OAB symptoms allowed us to verify in an exploratory way that their order of preference for the side effects cognitive effects, constipation and blurred vision did not differ from those of the non-OAB subpopulation. Therefore, we believe the validity of the conclusion of our study is not affected by our initial choice to administer the questionnaires to a group consisting of both participants suffering from OAB symptoms and individuals without such symptoms instead of to a pure OAB group. More importantly, we do not know which of the people suffering from OAB were treated with antimuscarinics. We cannot exclude that people change their preferences once they have been treated with these drugs.

4.4 Further Research

This study did not assess the cost effectiveness of different antimuscarinics because we wanted to avoid any confounding effect to the appraisement of the side effects. This DCE was developed to investigate the relative influence of side effects on choices people make rather than to really predict their behaviour. Additional studies investigating the impact of effectiveness and cost on older people's choice and comparing stated preferences and actual behaviour are needed.

Use of a larger participant sample would enable more detailed analysis of differences between subgroups. Our limited data were suggestive of the hypothesis that older people's preferences for side effects were equal between people with and without OAB. We also found that a score of anxiety or depression on the EQ-5D was correlated with inconsistent choices on the DCE, but this needs verification. The addition of psychological tests and subgroup analysis of those patients in larger sample sizes could give insight into their characteristics. Additionally, the EQ-5D questionnaire may be used as a screening test to help identify people with inconsistent choices in DCEs. Our findings could thus provide preliminary evidence of the value of the EQ-5D in DCE in healthcare.

5 Conclusions

We hope the information presented here will be informative for prescribers and helpful in their communication with older people who would likely benefit from antimuscarinic treatment for OAB.

Older people attribute more importance to loss of cognitive function as a possible side effect of antimuscarinic treatment than to the three most prevalent possible side effects of this treatment.

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Compliance with Ethical Standards

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Research involving human participants The protocol, informed consent form and other information given to participants were reviewed by the Ethics Committee of Ghent University Hospital (2015/0421). The study was conducted according to the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments.

Informed consent Informed consent was obtained from all individual participants included in the study.

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