Anticholinergic Burden in Older Patients (≥70y) with Polypharmacy

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# Introduction

Polypharmacy, the concomitant use of multiple medications in a single person, has become increasingly common, especially amongst the older population. Indeed, the level of hyper-polypharmacy (≥10 drugs) in older people had increased from 4.9% to 17.2% between 1995 and 20101. Although the use of several medications may be appropriate to manage a patient’s multimorbidity, it is recognised that each additional medication is likely to have less additional benefit and may increase the risk of adverse effects, drug interactions or dangerous monitoring errors2. Polypharmacy also contributes to the financial burden and carbon footprint of the NHS, which could be reduced by effective medication reviews and deprescribing medicines no longer being taken by the patient, but which continue to be dispensed. It is important to recognise that climate change and global and individual health burdens are not mutually exclusive as climate change influences the social and environmental determinants of health3 and so any steps taken to reduce the carbon burden of the NHS also have huge health benefits.

A specific area of polypharmacy and prescribing that needs addressing in older populations is anticholinergic prescribing. Medicines with anticholinergic properties are commonly prescribed for conditions such as depression, neuropathic pain, Parkinson’s disease and urinary incontinence4. The cumulative anticholinergic effects of taking multiple medications with anticholinergic properties is known as the anticholinergic burden5. Evidence shows that a high anticholinergic burden is associated with a number of significant adverse health risks, from a dry mouth (which can lead to poor oral health) to urinary retention, constipation, falls (which can have potentially fatal or disabling consequences) and cognitive decline5,6. Some evidence suggests there is also an association between increasing anticholinergic burden and increased odds of death6. It is possible however that in this study, the increased deaths found in the high anticholinergic group was confounded by severe disease or other factors rather than being directly due to the use of anticholinergics.

Older adults (≥65y) are more vulnerable to the effects of anticholinergic medication due to physiological, pharmacodynamic and pharmacokinetic changes that occur with aging5.This, in addition to the increased likelihood of multimorbidity and polypharmacy, puts this population at a potentially significantly increased risk of adverse medication effects.Understanding the impacts of polypharmacy and anticholinergic burden in the older population is important due to our ageing population and the impact this has on healthcare resources and clinical practice in primary care.

9246 patients are currently registered at Richmond Medical centre, with 1059 (11.45%) aged ≥70 years old7. After discussion with Dr H Smith, a GP at the practice, it was decided to focus this audit on the anticholinergic burden of this population as this is an area which is probably under-recognised and has not previously been addressed at the surgery.

# Methods

SystmOne’s clinical reporting tool was used to search for the population of this audit. Two existing searches in the system were joined together to create a new search consisting of all non-palliative patients who are ≥70 years old, with 10 or more items on repeat prescription including at least one anticholinergic drug. There was a total population of 90 patients from which a random sample of 40 patients was obtained using a random number generator. It was chosen to search for patients with 10 or more repeat items account for some patients having non-drug prescriptions such as catheter bags and zerobase creams. After these non-drug prescriptions were removed, any patients with <7 medications were to be excluded from the sample. 1 patient was excluded from the sample for this reason, and another was excluded because they were now considered palliative. This left a sample of 38 patients.

Each patient’s anticholinergic burden (ACB) score was calculated based on their repeat prescriptions using an online ACB calculator8.

Each patient’s notes from the last 12 months were then read to determine whether or not each of the criteria had been met. For the final criterion, only patients with an ACB ≥3 were included. To ensure nothing had been missed, the code “XFa8d” was used to search for medication reviews and the notes were searched entries which included terms such as “anticholinergic”, “ACB” and “burden”. The results were recorded in Microsoft Excel and from here a table of results and graph was generated for analysis.

# Criteria

1. ***Is there evidence of a medication review in the last 12 months? (95%)***

Polypharmacy guidance from NHS Scotland highlights the importance of a structured medication review with input from the patient, particularly in the older population, as the first step in reducing inappropriate polypharmacy9. This is supported by NICE guidance on medicines optimisation10.

At Richmond Medical Centre, medication reviews are conducted by GPs or clinical pharmacists and involve checking the medications are appropriate, that there are no dangerous drug interactions and reauthorising them without patient input. It is recognised that this is not ideal, but it is a pragmatic decision the practice have made due to the lack of time capacity to complete more time-consuming structured medication reviews. This was counted as fulfilling the criterion in this audit.

1. ***Is there evidence that an anticholinergic burden score has been calculated in the last 12 months? (80%)***

Anticholinergic burden is recognised by NICE guidelines as a potential reversible cause of cognitive decline and state that it should be explored before referral to dementia diagnostic services10**.** Although the guidelines do not specifically recommend calculating ACB scores, they highlight that there are validated tools available to clinicians for assessing anticholinergic burden10 and given that the population of this audit are vulnerable to the effects of these medications, it would seem sensible to calculate their ACB scores. There is insufficient evidence to suggest that one tool should be used in preference to others10, so it was not specified in this criterion which tool should be used.

Furthermore, many clinicians may recognise drugs with a high anticholinergic activity (i.e. medicines with an ACB score of 3) such as amitriptyline but due to the extensive list of medications, it is much more difficult to remember and recognise those with a lower 1-point burden. A total score recorded in the notes would therefore allow easy identification of high-risk patients which can be acted on if necessary. It may lead to fewer potentially unwise prescriptions being made.

1. ***In patients with an ACB score ≥3, is there evidence that the risks and side effects of anticholinergic medication has been discussed with the patient in the last 12 months? (70%)***

An ACB score ≥3 makes the patient at high risk for falls and cognitive impairment8, which is why this cut off has been used and these patients should be monitored for these adverse effects. There may be inter-individual variability in terms of response to anticholinergic medications9and so discussions with the patient could elicit side effects they may be experiencing and whether they are able to tolerate their ACB.

# Standards

The set standards were all discussed and agreed with Dr Smith.

95% was chosen as the standard for the first criterion because all patients should have their medications checked and reauthorised each year. The 5% leeway is to allow for patients who may be flagged as needing a review at around 12 months and then the review is completed in the following month (which would be the 13th month and therefore not fulfil this criterion but is still clinically acceptable).

For the second criterion, 80% was set as ACB scores can be calculated very quickly and easily and could be extremely informative to have in the patient’s notes which could encourage prescribing safety.

The standard for the third criterion was set to 70% because it is appreciated that these discussions will be time-consuming so 100% is not realistically achievable every year. Furthermore, some patients may have had repeated discussions regarding anticholinergic burden in the past and always wish to remain on their medications. In this case, less frequent discussions could be appropriate.

# Results

The final audit sample consisted of 38 patients with an average age of 82 years. 72% (n=31) were female and 18% (n=7) were male. This appeared to reflect the demographics of the total population. 76% (n=29) of the sample had an ACB score of ≥3 and the highest ACB score was 11. The most common medications with anticholinergic effects prescribed were furosemide and codeine, both of which carry an ACB score of 1. The most common drug with an ACB score of 3 prescribed was solifenacin. The results of the criteria are shown in the table and graph below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Criterion** | **Total (n)** | **Achieved (n)** | **Actual** | **Standard** |
| **1) medication review in last 12 months?** | 38 | 38 | 100% | 100% |
| **2) ACB score calculated in last 12 months?** | 38 | 0 | 0% | 80% |
| **3) discussion with patient r.e. anticholinergics in last 12 months?** | 29 | 0 | 0% | 70% |

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# Discussion

100% (n=38) of medication reviews had been completed. This is above the set standard of 95% and is extremely encouraging that all patients are receiving timely medication reviews. Most patients in this population were in fact receiving reviews more often.

No ACB scores had been calculated and recorded and there were no records of discussions with patients regarding the possible side effects and risks of high anticholinergic burden. This falls significantly below the standards for these criteria (80% and 70% respectively). This is unsurprising as it is not currently a well-recognised issue in primary care, but it does show an opportunity where positive changes can be made to improve patient care and safety. It is possible that some calculations and discussions may have been done but not recorded in the notes.

Specific anticholinergic burden scores were not audited because it is difficult to determine whether the prescribing is appropriate or inappropriate, as the risk-benefit judgement is made on an individual patient basis and in some cases the benefits of the medications will outweigh the risks of a high anticholinergic burden. However, it is important to note that a very high proportion of patients in the sample had a high anticholinergic burden score of 3 or more. Patient adherence cannot be determined from SystmOne, so without speaking to the patient it was impossible to know whether the prescribed medications are still all being taken by the patient and therefore whether they are actually exposed to the calculated burden or not. When calculating the ACB scores, it was assumed that there would be a class effect and so some medications were counted towards the score that were not specifically mentioned in the calculator. For example, ranitidine had an ACB score of 1 so patients who were prescribed other H2 antagonists, such as famotidine and nizatidine, were also given 1 point for these medications. It is worth noting that this resulted in 7 more patients having a high total ACB compared to if only the medications found in the calculator were counted.

Some evidence shows that the risks could be dose dependent and increase with longer exposure time9, but this was not explored in this audit as the calculator does not take this into consideration.

# Recommendations

The first step to improving anticholinergic burden is to calculate the ACB score for every patient. As the population in this audit (i.e. those ≥70 years (excluding palliative care) with polypharmacy) are more vulnerable to the effects of anticholinergic medications, this would be a good population to start with. The surgery’s pharmacist technician could quickly and easily calculate a patient’s ACB score using the online calculator in the month prior to the patient’s medication review and record this score in the patient’s notes. This whole process would take approximately 5 minutes per patient, and with 90 patients in the population this equates to approximately 10 minutes of work each week. Having the score readily available could help guide the clinician’s review and could highlight the patients with a high burden who could benefit from a patient involved medication review or at least a discussion regarding anticholinergic burden.

Following on from this, patient involved medication reviews should be carried out in those with an ACB ≥3. For complex patients, it is unlikely that a structured medication review could be carried out in a 10-minute GP appointment. This concern was raised at the practice meeting. It was therefore suggested that this could be a potential job for the clinical pharmacist, if agreeable, who may be able to allocate more time for these patient’s reviews.

Prescribing tools such as STOPP/START, or the MAP tool developed by the Ealing Hospital NHS Trust11 could be utilised during reviews and when prescribing new medications. This could help reduce anticholinergic burden and polypharmacy which would be of great benefit to patient care and to the environment.

A long-term aim would be to develop a built-in ACB calculator for SystmOne. This has already been done for the EMIS healthcare system and so it is possible, but it is unlikely to be something that the practice can do and needs to be recommended to the central SystmOne team.

A re-audit should be arranged to determine whether these interventions have improved the management of anticholinergic burden in this high-risk population. If successful, the population could be widened to include those aged 65-70 years as the evidence shows that the risks of high ACB affect those aged ≥65 years.

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