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Gender disparities in oral anticoagulants

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Abstract

Aims
The aim of this pilot study is to examine gender disparities in oral anticoagulant use in patients with permanent atrial fibrillation (AF) in Irish general practice.

Methods
A descriptive, cross- sectional observational study was undertaken. Proportionate sampling was used across 11 practices from the South East of Ireland. The GPs completed a report form on each patient by undertaking a retrospective chart review.

Results
These 11 practices had a total number of 1855 patients with AF. We received data on 153 patients; 104 males, 46 females and 3 charts with missing data on gender. Our main finding was that 20% (N=21) of patients were on an incorrect NOAC (Novel oral anticoagulant) dose. A chi-square test of independence showed that inappropriate dosing was significantly associated with female sex.

Discussion
Inappropriate NOAC dosing can be associated with bleeding, thromboembolic events and all-cause mortality. Given that there is a dominance of women in the ageing global population and they are at higher embolic risk according to the CHA2DS2-VASc score, this gender disparity needs to be addressed.

Introduction

Appropriate use of oral anticoagulation (OAC) for AF can reduce the risk of stroke by up to 64%. 1 While NOAC prescribing is increasing in Ireland, 2 patients are commonly undertreated with OAC and prescribed incorrect doses of OAC. 3,4 Inaccuracies and gender differences in OAC prescribing have not been previously investigated in an Irish general practice setting.

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Methods

We conducted a descriptive, cross-sectional observational pilot study in the South-East of Ireland examining the pattern of OAC use in patients with permanent AF in general practice. Proportionate sampling was used across 11 general practices. These practices were recruited from the Ireland East practice-based research network. The participating GPs completed a report form on each patient by undertaking a retrospective chart review. These data were cleaned, pooled and inputted into a secure database by the research team. Analysis was done using the Statistical Package for the Social Sciences (SPSS) programme.

Results

Eleven practices participated with a total number of 1855 patients with AF. We received data on 153 patients. There were 121 (80 males and 41 females) patients on NOACs. The mean female age was 79.2 years and the mean male age was 74.8 years.

We analysed these patient records to ascertain if they were on the correct dose of the NOAC according to the product license and summary of product characteristics. Sixteen records were incomplete and did not have key information recorded such as age, weight, or renal function and so we could not determine if the dosage was correct.

Of the 105 records analysed, 80% (N = 84: 61 males and 23 females) were on the correct dose and 20% (N=21: 10 males and 11 females) were on an incorrect dose. The most common error was the inappropriate prescription of apixaban 2.5mg BD (Figure 1).

A chi-square test of independence was performed to evaluate the relationship between correct NOAC dose and gender. The relationship between these variables was significant, X2 (1 , N = 105) = 4.795 , p <.05 (p= .029). Males were more likely to be on the correct NOAC compared to females. However, when adjusted for age this result did not remain significant. This pilot study was not powered to detect significant differences should they emerge. We plan to extend the analyses and believe that this observation is worthy of clinical action and dissemination.

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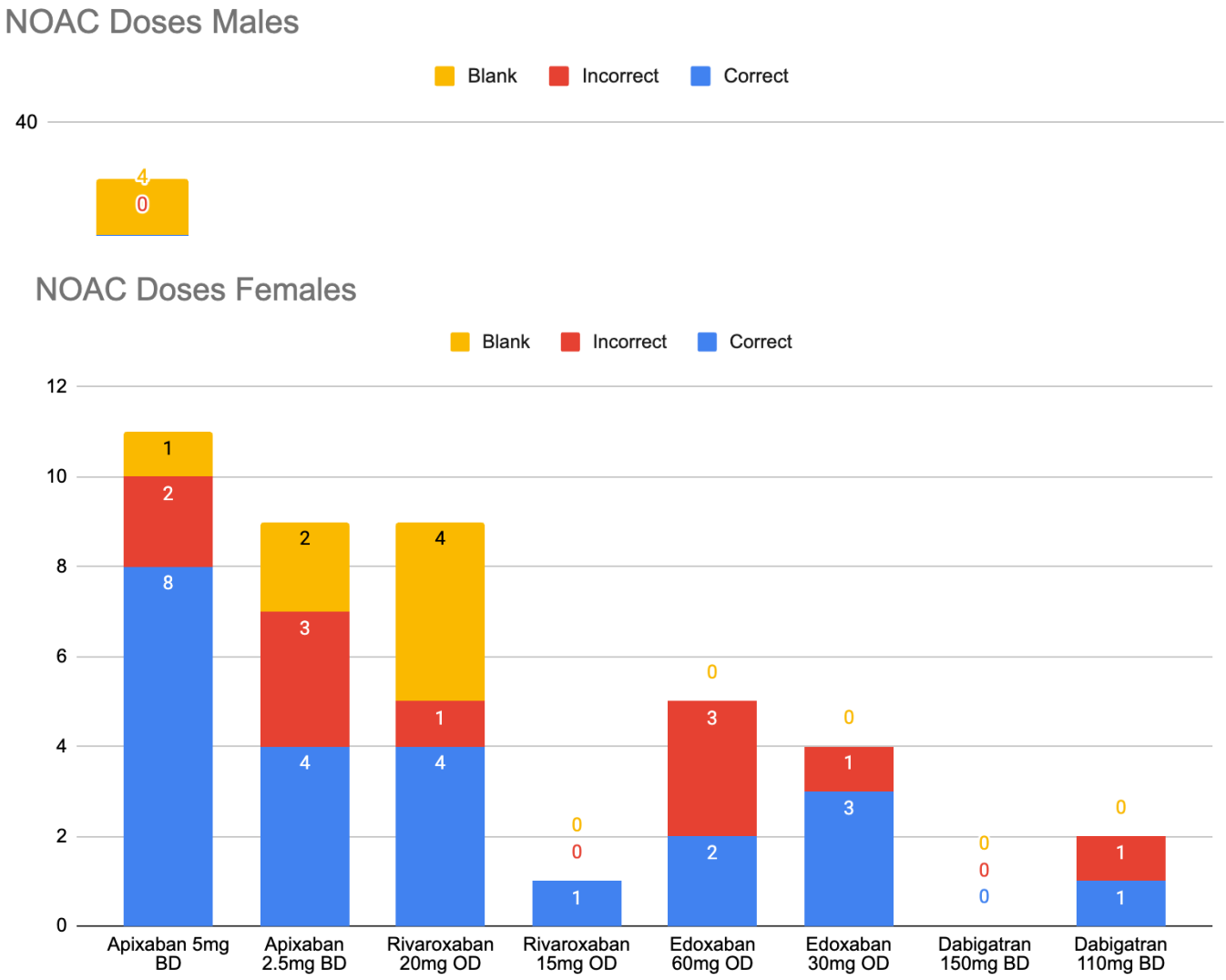
Figure 1: Non-vitamin K antagonist oral anticoagulant (NOAC) doses in Males & Females



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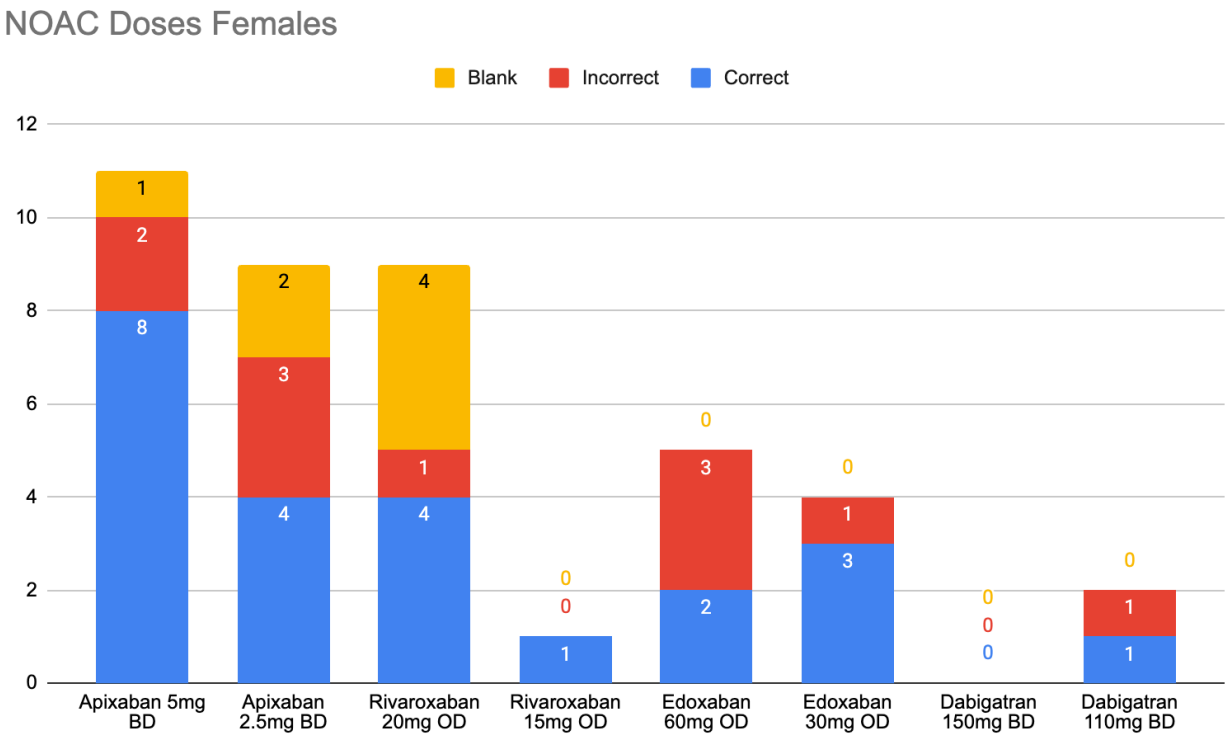

Discussion

Female sex is recognised in the CHA2DS2-VASc score as a risk factor for embolic stroke and yet women are less likely to be on an appropriate dose of OAC as illustrated in this pilot study. Although this finding has been repeatedly demonstrated, [2,3] the reasons behind this discrepancy are less clear.

Women experience adverse drug reactions more frequently when compared to men. Therefore, women are more likely to report a history of minor bleeding while on NOAC therapy which is associated with an increased risk of underdosing.[4] This off-label underdosing can put patients at a higher risk of all-cause mortality and does not however reduce bleeding outcomes. [4]

All NOACs have some degree of renal clearance and appropriate dosing is based on creatinine-clearance calculated using the Cockcroft-Gault formula. Most laboratories in Ireland report renal function as an estimation of the glomerular filtration rate (eGFR ml/min) using the Modification of Diet for Renal Disease (MDRD) formula which can overestimate renal function in older patients, those with low body weight and females. [5]

Higher levels of NOAC underdosing is associated with advanced age [3,4] and there is a dominance of women in the ageing global population. In this study, the mean female age of those with permanent AF was 4.4 years older than males.

Health care professionals (HCPs) may be underestimating the risks of stroke for women with AF for the same reasons that heart disease in women is not fully appreciated. Women may be perceived as frailer causing safety concerns for the prescribing clinician who may then underdose the patient compromising efficacy of the OAC. Female patients with AF are treated more conservatively in other aspects of their care as well ; they are less likely to receive anti-arrhythmic therapy, cardioversion or catheter ablation. [2]

The 11 practices that took part were a mixture of small and large practices from urban and rural areas across four counties, therefore we believe this to be a representative sample of care in Ireland.

With the rising prevalence of AF and an ageing global population, an important opportunity exists to eliminate the paradox of those at higher embolic stroke risk being more likely to be on inappropriate treatment. This gender gap may be best closed using the aid of decision support tools, computerised calculations, or artificial intelligence to support decision-making.

Declarations of Conflicts on Interest:
None declared.

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