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A CASE OF ATRIAL FIBRILLATION IN AN ELDERLY PATIENT WITH RECURRENT FALLS AND DEMENTIA

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ABSTRACT

A case study highlighting the complexity in the management of newly diagnosed atrial fibrillation in an elderly female with recurrent falls and a lack of mental capacity. This demonstrates a delicate balance between reducing thromboembolic phenomenon and bleeding risks.

Keywords: Atrial fibrillation, falls, bleeding, mental capacity, elderly

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INTRODUCTION

This is a case study of an elderly female with newly diagnosed atrial fibrillation on a background of recurrent falls, dementia and a lack of mental capacity. We illustrate the nuances in balancing the benefits and risks of anticoagulation and emphasise the importance of shared decision making. The family physician performed an integral role as the facilitator between the specialist, patient and family to formulate her final management plan.

CASE PRESENTATION

History of Presenting Complaint

Madam C is a 79-year-old Chinese female on regular follow-up at a family medicine clinic for chronic disease management. At a routine visit, her family reported an episode of transient loss of consciousness during a leisurely stroll three weeks ago. This was witnessed by her family, and they denied any seizure-like activity during the episode. She fell forwards and struck her head on the ground. She spontaneously regained consciousness within seconds and sustained no visible injuries hence no immediate medical attention was sought. Prior to this episode of transient loss of consciousness, she did not experience any focal neurological symptoms, dizziness, palpitations, chest pain, dyspnoea, cold sweats or infective symptoms. Her dementia day care centre noted that her daily blood pressure and blood glucose levels were marginally high in the past month prior this current encounter, and there were no hypoglycaemic episodes. At this encounter, she was well and denied any prior falls in the past year. However, it was noted that she suffered multiple previous falls in 2016 and 2017, attributed to poor safety awareness and intercurrent illnesses.

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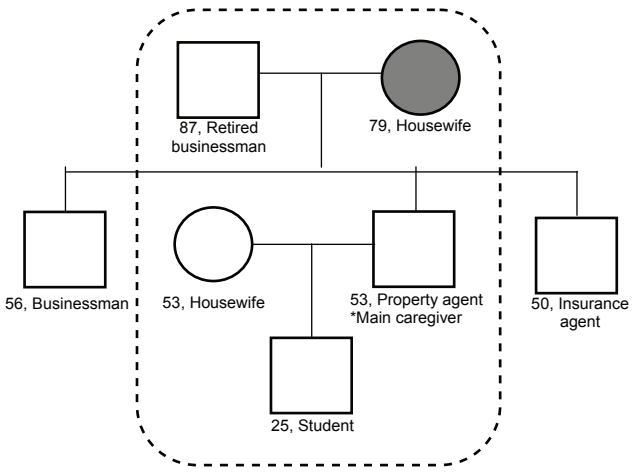
Past Medical History

Her past medical history includes hypertension, hyperlipidaemia, type 2 diabetes mellitus, peripheral vertigo, depression, subdural hematoma (SDH) treated with burr hole surgery in 2010, bilateral cataracts and osteoporosis with multiple fragility fractures (right neck of femur and right distal radius fractures). She was diagnosed with Alzheimer's disease in 2016, complicated by behavioural and psychological symptoms of dementia (BPSD). Her Mini-Mental State Examination was stable at 13/30, and her BPSD were well controlled. Her medications include amlodipine, lovastatin, metformin, cholecalciferol, alendronate, donepezil and fluvoxamine.

Social History

She is independent in her basic Activities of Daily Living (ADL) but assisted in her instrumental ADL. She is community ambulant with a walking stick. She lives with her husband (who has dementia) and second son's family in a five-room HDB flat serviced by a lift landing. Her second son supports them and has no financial concerns. She does not smoke nor drink alcohol and denies traditional Chinese medication consumption.

Figure 1: Genogram



Physical examination

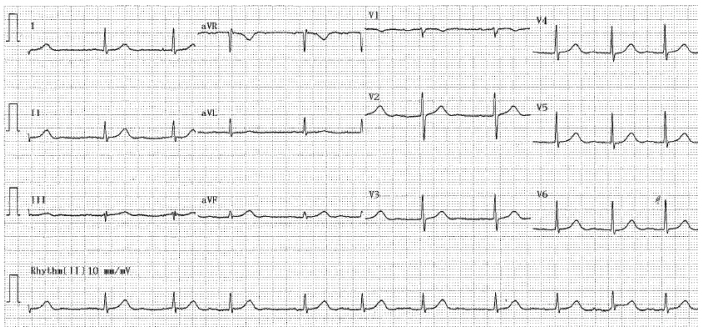
She was alert and comfortable at rest. Her vital signs were normal, and there was no postural hypotension. She had an irregularly irregular pulse at a rate of 80. She was not jaundiced

nor pale. Vision examination noted a loss of red reflex with reduced visual acuity. She had no goitre or signs of hyperthyroidism. No carotid bruit was noted. Heart sounds were dual with no murmurs. Examination of the lungs and abdomen were unremarkable. No focal neurological deficits were found, and she ambulated well with her walking stick. A systemic review revealed no injuries associated with the fall (no cephalohematoma, bruising, and tenderness over long limbs, trunk and back).

Investigations

A 12-lead electrocardiogram (ECG) confirmed atrial fibrillation at a rate of 68 without any signs of ischemia as seen in Figure 2. This was not noted in her previous ECG done a year ago. Blood investigations (random capillary blood glucose, full blood count, renal panel, liver function test and thyroid function test) were normal. An MRI Brain done a year ago showed chronic microvascular ischemic changes, age-related involutional changes and resolution of the SDH.

Figure 2: 12-lead ECG



PROBLEMS IDENTIFIED

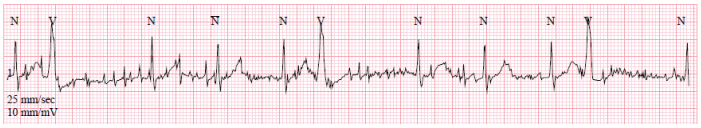
1. Newly diagnosed atrial fibrillation that possibly contributed to her episode of transient loss of consciousness.
2. High fall risk on a background of recurrent falls with consequent risks of intracranial haemorrhage.
3. Lack of mental capacity for decision making.

MANAGEMENT

In light of her transient loss of consciousness, recurrent falls and newly diagnosed atrial fibrillation, we referred her to a cardiologist for further evaluation. A follow-up consultation was arranged after the cardiologist review.

At the subsequent consult, it was noted that the cardiologist's impression was stable atrial fibrillation without indication for pacemaker placement and had offered anticoagulation treatment. Holter monitoring revealed infrequent atrial and ventricular ectopic beats and atrial fibrillation as seen in Figure 3. 2D echocardiogram revealed left ventricular hypertrophy with no significant valvular pathologies. Both Madam C and her second son were undecided regarding anticoagulation then and sought the opinion of her family physician at this visit.

Figure 3: Holter monitoring



We discussed the indications for anticoagulation and risks of bleeding detailed in Table 1 and recommended for anticoagulation based on her calculated CHA_2DS_2-VASc score of five. Anticoagulation options of warfarin versus novel anticoagulants (NOACs) were offered. We explained that in Madam C's case, both options were similar in the prevention of strokes and systemic embolisation. Warfarin is a cheaper alternative but will require frequent monitoring via blood tests. Although all NOACs have a lower risk of intracranial haemorrhage compared to warfarin, the risks of gastrointestinal bleeding are higher with dabigatran and rivaroxaban as compared to warfarin. Finally, if the patient were to suffer a major bleed, the reversal agent for warfarin is readily available and cheap in comparison to those for NOACs.

During our discussion, it was apparent that Madam C could not retain the information about anticoagulation nor weigh the benefits and risks of anticoagulation treatment. Thus, she lacked the mental capacity to decide on anticoagulation treatment. She also did not have a lasting power of attorney (LPA). Her main caregiver, being her second son, was hence identified by the family as the main surrogate decision-maker of her medical affairs. We strongly recommended for anticoagulation given her high risk for thromboembolic events. However, after consideration of Madam C's desire for independence, he decided against anticoagulation in view of the need for frequent monitoring, bleeding risks and consequent disability. His decision against anticoagulation was respected by the medical team. We then sought to mitigate Madam C's falls risk as detailed in the discussion below.

Table 1: Risk calculations for Madam C

CHA_2DS_2-VASc Score		**HAS-BLED Score**	
Age	+2 (≥75)	Hypertension	+1 (Yes)
Sex	+1 (Female)	Renal disease	0 (No)
Congestive Heart Failure	0 (No)	Liver disease	0 (No)
Hypertension	+1 (Yes)	Stroke	0 (No)
Stroke/TIA/Thromboembolism	0 (No)	Prior major bleed	+1 (Yes)
Vascular disease	0 (No)	Labile INR	0 (No)
Diabetes	+1 (Yes)	Age > 65	+1 (Yes)
Total Score = 5 **Anticoagulation Class 1 recommendation**		Predisposing medications	0 (No)
		Alcohol	0 (No)
Stroke risk was **7.2 percent** per year in >90,000 patients and **10.0 percent** risk of stroke/TIA/systemic embolism[1]		**Total Score = 3**	
		Risk of major bleed was **3.7** bleeds per 100 patient-years[2] and **5.8 percent** in another validation study[3] **High risk for major bleed**	

LITERATURE REVIEW

Evidence-based practice

It is prudent for family physicians to apprise themselves of the latest 2019 AHA/ACC/HRS[4,5] guidelines, 2017 ACE guidelines[6] and 2016 ESC guidelines[7] regarding atrial fibrillation (AF) management. A concise review is given below.

Benefits of anticoagulation
Oral anticoagulants are a Class 1 recommendation for AF with CHA2DS2-VASc score ≥2 in males and ≥3 in females.[5,7] Some clinicians may favour the modified CHA2DS2-VASc score which recommends for anticoagulation at a score ≥2 and excludes gender from the equation.[6] The absolute risk reduction of thromboembolic events with warfarin compared to placebo is 2.7 percent per year.[4] Aspirin is no longer recommended for AF prophylaxis.[4,7,8] Warfarin is superior to aspirin in reducing thromboembolism.[9]

NOACs are recommended over warfarin where eligible except in patients with moderate to severe mitral stenosis or mechanical heart valves.[5,7] NOACs are as effective as warfarin in reducing AF-related strokes and systemic embolisms.[10]

Adverse effects
Comparing NOACs to warfarin, all NOACs have a lower risk of intracranial bleeding. However, dabigatran and rivaroxaban are associated with higher risks of gastrointestinal bleeding.[10] The Birmingham Atrial Fibrillation Treatment of the Aged Study (BAFTA) trial showed that warfarin and aspirin have comparable bleeding risks.[9]

Effect of age on AF, thromboembolism and bleeding risks
Stroke and bleeding risks increase with age. Age is a contributing factor in both the CHA_2DS_2-VASc and HAS-BLED score. Comparing patients receiving anticoagulation to those not receiving anticoagulation, the absolute risk reduction of thromboembolic events in the group receiving anticoagulation is 0.5 percent per year (for those aged <85 years) versus two percent per year (for those aged ≥85 years). The occurrence of major bleeding in patients not receiving anticoagulation versus those receiving anticoagulant therapy was not significantly different in the subgroup aged <85 years (3.4 versus 2.9 per 100 patients/year) and in the subgroup aged ≥85 years (4.2 versus 4.0 per 100 patients/year). Thus, the absolute benefit of anticoagulation increases with age.[11]

Non-pharmacological methods to prevent embolisation events in AF
Percutaneous placement of a left atrial appendage (LAA) occlusion device may be considered in patients who have contraindications for long term anticoagulation but are at high risk for ischemic strokes.[5,7] It is estimated that 90 percent of left atrial thrombi are located in the LAA and hence occlusion can reduce risk of thromboembolism.[12]

Falls and bleeding risk
Falls are an important source of morbidity and functional impairment in the elderly. The incidence of falls in elderly Singaporeans ≥ 60 years of age approximates 17.2 percent per year.[13] Although anticoagulation is associated with a higher risk of bleeding in patients who fall, the absolute risk is small.[14] Perception of high fall risks should not preclude anticoagulation in the elderly who are otherwise suitable candidates for anticoagulation. On the contrary, interventions should be implemented to mitigate fall risks.[15] In this patient, we identified risks factors for falls and interventions as shown in Table 2.

Table 2: Risk factors and mitigating factors for falls[16]

Risk factors	Mitigating factors
Visual impairment from cataracts	• Cataract surgery to improve vision.
Peripheral vertigo	• Vestibular rehabilitation. • Pharmacological management.
Frailty and sarcopenia	• Physiotherapy involving balance and coordination training, lower limb strengthening, endurance and flexibility training.
Polypharmacy	• Down titration of oral hypoglycaemic agents with acceptance of target HbA1c <8 percent in view of her age. • Medication reconciliation with pharmacists.
Environmental hazards	• Involvement of occupational therapists to assess home environment and provide recommendations (e.g. grab bars installation, non-slip mats in bathrooms, methods to avoid clutter).
Poor safety awareness	• Patient and family education on fall risk precautions.

Role of the Family Physician (FP)

The FP is in a privileged position to facilitate shared decision making between the patient, family and specialists. By taking recommendations from specialists and integrating them with patient's and family preferences, ideas and values, he is able to provide an avenue for individualised informed decision making.

In this case, the FP has to first assess the patient's mental capacity to make health decisions. Based on the Mental Capacity Act (MCA Chapter 177A)[17], a person is assumed to have mental capacity until proven otherwise. Having a medical or mental illness does not imply that patient is mentally incompetent. Assessment of mental capacity is time and decision dependent. A person is deemed unable to make a decision if he/she cannot perform one of the following in relation to a specific decision at a time it must be made:

1. Understand the information
2. Remember the information
3. Weigh up the information
4. Communicate the decision

After assessing that a patient lacks mental capacity, the FP must seek to identify a healthcare advocate for the patient (either an appointed LPA, a court-appointed deputy or a caregiver) who collaborates with the FP to act in the patient's best interests. The patient's family should be treated as a significant moral

participant in medical decision making.[18]

In Singapore, as most patients do not have a LPA, it usually falls upon a caregiver (usually family members) to make decisions based on patient's best interests. However, this excludes decisions regarding life-sustaining treatment. Best interests of a patient should take into account his/her prior beliefs, values, experiences and preferences before mental capacity was lost. Table 3 provides an example of the four-box method[19] used to guide decision making in this case.

Table 3: Four-Box Method[19]

Medical Indications	Patient Preferences
• Anticoagulation is recommended for reducing the risks of thromboembolic events. • There are no absolute contraindications to anticoagulation. • Anticoagulation increases bleeding risks.	• The patient lacks mental capacity and has no LPA. • Patient's second son (main caregiver) is the appropriate surrogate provided decisions made are based on the patient's best interests.
Quality Of Life	**Contextual Features**
• The patient is currently basic activities of daily living (BADL) independent and community ambulant. • Stroke can cause disability. • Intracranial bleeds from falls can compromise function. • Warfarin anticoagulation requires regular blood tests, strict dietary adherence and good compliance.	• Patient's previous history of SDH requiring burr hole surgery is a deterrent for her son to initiate anticoagulation. • High costs of NOACs and the need for frequent blood tests are limiting factors. • Under MCA section seven, the law permits a caregiver to make healthcare decisions based on the patient's best interests.

After consideration of the four-box factors, Madam C's second son decided against anticoagulation. His decision as her surrogate decision-maker was respected. The FP should seek to uphold and maintain the fiduciary relationship formed with patients and their family members.[20] Imposing a medical decision on them will only lead to a backlash and distrust in the FP. In this case, if anticoagulation had been prescribed, her son would not have administered it, and his confidence in our care would have dwindled.

CLINICAL PRACTICE POINTERS

1. The decision for or against anticoagulation should be formulated based on the benefits and risks of anticoagulation. Frequent falls as a single factor should not deter physicians from anticoagulation.
2. Family physicians are in a privileged position to actively facilitate shared decision making.
3. The four-box method is a useful tool to guide ethical decision making for patients with impaired mental capacity.

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