TRANSIENT ISCHAEMIC ATTACK:

A PRIMARY CARE PERSPECTIVE OF

STROKE PREVENTION

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ABSTRACT

Transient Ischaemic Attack: a primary care perspective of stroke prevention

Transient ischaemic attacks (TIAs) are a warning sign for stroke. The early assessment and management of TIA can decrease the subsequent risk of stroke but the best model of care for TIA has not been established. General practitioners (GPs) in primary care have a significant role in secondary prevention for patients following a TIA and may also be the initial clinician assessing a patient with a suspected TIA. The clinical diagnosis of TIA can be challenging and there is limited literature describing how GPs assess and manage TIAs in practice. Diagnosis and assessment can be assisted by clinical scores and imaging, but these tools may not be accessible or have not been validated specifically in primary care. GPs with special interests (GPwSI) have been involved in providing expert care in areas where access to a specialist may be limited, and a GPwSI in stroke and TIA could be valuable in a TIA care pathway.

The aims of this research were to:

1. Determine GP knowledge on current stroke and TIA assessment and management.
2. Educate GPs on the assessment of acute neurological symptoms and the early management of TIA.
3. Examine if additional tools that assist in the assessment and diagnosis of TIA including plasma protein biomarkers can be used in primary care.
4. Determine if a collaborative strategy for TIA management, using GPwSI in a community-based rapid-access TIA clinic (COMBAT clinic) linked with a

specialist-based, hospital Rapid Access Clinic (RAC) is a feasible model of TIA care.

5. To assess the role of imaging in a community-based TIA clinic.

Methods and Findings

A cross-sectional study of GPs in Western Adelaide was conducted to determine the knowledge of TIA assessment and management, and identify perceived barriers. This self-administered questionnaire of 32 GPs found knowledge deficits in TIA care especially diagnosis and treatment. Participants also identified access to neurology specialists as a barrier and that specific education for GPs was needed. This research highlighted the need to improve TIA knowledge amongst GPs with education specifically designed for general practice and that improvement was needed in management pathways of TIA care locally, including access to specialist opinion.

A number of resources were thus developed to educate GPs and improve their knowledge and confidence around TIA care. A review of the literature was undertaken and published for GPs specifically. Given the difficulty in diagnosing TIAs and the numerous mimics that may present in primary care, an approach to a "funny turn" was developed and published in a "10-minute consultation" format. GPs respond to different modalities of education delivery and as such two further learning modules were developed. A self-directed learning module was developed for GP registrars and a case of a "funny turn" was written for the independent GP learning program "check". Time limitations in GP consultations can be a barrier to effective assessment and a comprehensive clinical neurological examination may be a challenge. A five-minute approach to a patient with a suspected TIA was

demonstrated in a video for GP registrars to access and improve their clinical skills for acute neurological cases.

Given the challenge of clinically diagnosing TIA, other tools including imaging can assist in the assessment. However access to magnetic resonance imaging (MRI) in Australia primary care is limited and blood biomarkers could potentially be more useful. A study to identify novel plasma biomarkers for diagnosing TIAs and distinguishing them from TIA mimics was conducted.

With limited evidence about the best model of TIA care and the suggestion that GPs perceived access to neurology specialists was a barrier, we tested a novel model of TIA care. A proof of concept study explored the potential of a community-based (COMBAT) and hospital-based rapid access clinic (RAC). Low risk patients were assessed at the community-based clinic by GPwSI whilst higher risk patients were assessed at the hospital RAC. The study was conducted over eight months with 33 patients seen at the COMBAT clinic, of which 15 were diagnosed with TIA, and 43 at the RAC, of which 15 were diagnosed with TIA and 12 with stroke. One patient assess at the RAC had a subsequent stroke within 90 days.

Imaging is a valuable to tool in assessing patients with a suspected TIA, but access to MRI can be limited. Computed Tomography (CT) and CT Angiography (CTA) were performed in 17 of the 33 patients seen in the COMBAT clinic and 7 had positive CTA findings. CTA was found to be valuable in assessing patients and affecting their course of management, and a response to a paper on CTA in TIA assessment was published confirming these findings.

The publications presented in this thesis contribute to the existing body of work around TIA with a primary care perspective, hitherto deficient in the published literature. The knowledge of GPs about TIA assessment and management could be improved, but the development of educational resources needs to be tailored to GPs specifically and consider the availability of local TIA services.

An accurate diagnosis of TIA and stratification of risk allows the appropriate triage of patients with suspected TIA. As presented in this thesis, the discovery of a potential blood biomarker associated with TIA would be a significant contribution to reaching an accurate and efficient evaluation of TIA in primary care.

A novel model of TIA care involving a COMBAT clinic and RAC clinic can be a feasible pathway. Triaging lower risk patients to a community pathway and the use of CTA allowed patients with suspected TIA to be assessed and managed rapidly. As a result the RAC with its limited capacity to see one patient a day, could concentrate on higher risk patients with only one subsequent stroke at 90-days in the groups combined. This pathway is an innovative collaboration between primary care and hospital services, with the potential to improve patient outcomes, decrease stroke risk and be cost effective.

The resources available in different areas will influence the best model of TIA care, but the role of primary care remains significant. In continuing to improve the assessment and management of TIA, engaging GPs in education and supporting the collaboration between specialist hospital services and GPs is achievable and critical to the improvement of health outcomes.

THESIS DECLARATION

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

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ABBREVIATIONS

ABCD2	Age, Blood pressure, Clinical features, Duration, Diabetes
AFP	Australian Family Physician
BEACH	Bettering the Evaluation and Care of Health
COMBAT	Community-based rapid access transient ischaemic attack
CPD	Continuing Professional Development
CT	Computed tomography
DWI	Diffusion weighted imaging
ECG	Electrocardiograph
ED	Emergency Department
EDS	Electronic Decision Support
GP	General practitioner
GPwSI	General practitioner with a special interest
MRI	Magnetic resonance imaging
NIHSS	National Institute of Health Stroke Scale
NHS	National Health Service
NSF	National Stroke Foundation
RAC	Rapid Access Clinic
RACGP	Royal Australian College of General Practitioners
SFGPET	Sturt Fleurieu General Practice Education and Trainings
TIA	Transient ischaemic attack