

Barts and the London 2011 Elective**Objectives**

1. *What are the prevalent cerebrovascular conditions in Canada and how do they effect the elderly population? How is this similar and/or different to other developed countries?*
2. *Describe the leading causes of cerebrovascular disease in the ageing population and means of primary and secondary prevention in Canada.*
3. *How is TIA and stroke management organized in emergency departments in Vancouver? How is this similar and/or different to other developed countries such as the UK?*
4. *To be able to work effectively in a multi-disciplinary team to provide effective patient care and enhance my knowledge of stroke management in the acute setting.*

Report:

In Canada, the proportion of elderly individuals within the population is increasing and therefore due to this the medical conditions that are prevalent amongst this age group is also on the rise. The prevalent cerebrovascular conditions affecting this group of Canadians are transient ischemic attacks (TIA) and stroke. A transient ischemic attack is a sudden onset of focal central nervous system phenomena due to a temporary occlusion usually caused by an emboli of the cerebral circulation and the symptoms the patient experiences last less than 24 hours. After a TIA there is complete recovery but they usually reoccur and can act as warning signals of an upcoming stroke or they may lead to a stroke if appropriate investigations and preventative management strategies are not implemented. Furthermore, a stroke results from ischemic infarction (lack of blood supply) or bleeding into part of the brain which manifests by rapid onset of focal central nervous system signs and symptoms. Therefore, a stroke is a deficit in neurological function due a vascular cause and is lasts for more than 24 hours and unlike a TIA the deficits are not fully reversible. However, TIAs most often last up to an hour and those that experience signs and symptoms for longer than an hour typically go on to develop a stroke. Along with other developed countries, in Canada stroke is the major cause of neurological disease of our times, where the prevalence rises with age.

Within the elderly patient group, experiencing a stroke not only affects their health but other areas of their lives that reflect heavily on their independence and activities of daily

living. Therefore, providing patients with an excellent continuity of care and working with a strong multi-disciplinary team unit allows for a more effective rate and degree of recovery. Patients with stroke may require ongoing physiotherapy, occupational therapy, social care, counselling and the appropriate follow-up with physicians. As stroke care requires a multitude of health professionals, ongoing care and support to patients, this therefore, does impact health expenditure along with also having in some patients long lasting devastating effects on their lives. In this regard, understanding the causes of TIAs and strokes amongst health care professionals and the population, reducing the risks of strokes occurring by implementing primary and secondary measures and educating patients is imperative. The leading causes of stroke in developing countries are embolism (occlusion from a distant site), thrombosis (occlusion within a cerebral artery) and haemorrhage (bleeding within the brain). Other causes of stroke may include hypoperfusion, vasculitis, arteritis, mass lesions, venous sinus thrombosis, polycythemia, thrombophilia and carotid artery dissection amongst many others.

The two main risk factors linked with the development of cerebrovascular in majority of developed countries like Canada are hypertension and smoking. If hypertension were to be controlled and smoking cessation was undertaken there would be a significant reduction of risk of having a stroke. Therefore, in the primary care setting controlling patient blood pressure and routinely checking patient blood pressure can go a long way to improving cerebrovascular health. Also, implementing strong, encouraging and community based smoking cessation programs can have a huge impact on reducing risk of stroke. Other risk factors for the development of strokes are diabetes, heart disease, carotid artery stenosis, peripheral vascular disease, having a TIA in the past, carotid bruits, oral contraceptive pills, increased cholesterol, alcoholism and clotting disorders amongst many others.

Within Vancouver and other Canadian health care facilities emergency departments follow guidelines set out by Canadian medical legislative bodies. In the acute setting it is critical to take the appropriate history, conduct relevant investigations and then administer treatment within a short time scale to ensure the patient gets the upmost care. Outside the hospital, individuals should be educated on how to recognize signs and symptoms of a stroke and should act "FAST", i.e. looking at the face, arms, speech and time to act rapidly. The paramedics should when called support airway, breathing and circulation (ABC), give oxygen if needed, perform a pre-hospital stroke assessment (can use the Cincinnati prehospital stroke scale or the Los Angeles Preshospital Stroke Scale (LAPSS)), establish

when the patients symptoms arose, transport to triage or a centre with a stroke unit, alert the hospital and check glucose if possible. The pre-hospital stroke scales give a probability of a patient having a stroke taking into consideration any abnormal neurological deficits, duration of deficits and other criteria such as age.

Once arriving within the emergency department an immediate general assessment and stabilization of the patient is performed which should be done ideally within 10 minutes. This involves, assessing ABCs and vital signs, providing oxygen if needed, obtaining IV access and taking blood samples, checking glucose and treating any discrepancies as indicated, performing a neurological screening assessment, calling the stroke team, ordering an emergency CT brain scan and obtaining a 12-lead ECG. After this is done, an immediate neurological assessment should be performed by the stroke team which involves a review of the patient's history, establishing the onset of symptom onset which affects the patient's management plan and performing a neurological exam using the Canadian Neurological Scale or the NIH stroke scale.

Furthermore, once the CT brain scan is done the results are available management depends on whether there is a haemorrhage. If there is a haemorrhage, then neurologist or neurosurgeon should be consulted or transfer should be considered if they are not available. If there is no haemorrhage then there is a probable acute ischemic stroke and fibrinolytic therapy needs to be considered. If they are not a candidate for fibrinolytic therapy they will be given aspirin as a patient must fit all inclusion criteria and have no contraindications to thrombolysis which is provided as a checklist in the majority of Canadian emergency departments. A patient must be 18 or older, the clinical diagnosis of ischemic stroke with a measurable neurological deficit must be made and the time of symptom onset must be well established as less than 3 hours before treatment would be administered. Some of the contraindications to thrombolysis on this checklist include evidence of intracranial haemorrhage, clinical presentation of subarachnoid haemorrhage even with normal CT, history of intracranial haemorrhage or arteriovenous malformation, neoplasm or aneurysm, witnessed seizure at stroke onset, active internal bleeding or acute trauma or fracture, acute bleeding diathesis and stroke, intracranial or spinal surgery within the last 3 months amongst others. The contraindications of thrombolysis are well recognized and very similar in the majority of developed countries including the United Kingdom and protocols provided by NICE are very similar to the Canadian system. If a patient is a candidate for fibrinolytic therapy then the risks and benefits with the patient and family must be discussed and the

patient must be consented. If this is acceptable to the patient, tPA must be given and no anticoagulants or antiplatelet treatment should be given for the upcoming 24 hours as there is an increased risk of bleeding.

Furthermore, once the patient reaches the emergency department, ideally thrombolysis should be administered within the hour if the patient is a candidate for it as research shows that the sooner the patient receives this treatment the more effective the long term outcomes. Therefore, working effectively within a multi-disciplinary team in this acute setting is vital in order to provide these at risk stroke patients with the most optimal care. Working with the stroke team, I learned that it is very important to act as a productive and effective team player by recognizing one's own strengths and limitations. At the beginning of my elective in Vancouver, getting used to the logistics of the emergency department was my first task, then building my knowledge base by reading on my own, asking other physicians questions and attending teaching sessions and most importantly building my clinical confidence through many patient consultations was an excellent learning experience. As a member of the stroke team, my appreciation of team effort was markedly enhanced and I actively saw how effective managing a patient using a team approach was providing patients with the upmost care. Lastly, my experiences in Vancouver allowed me to acknowledge the importance of team management, patient education and the essence of self-reflection as a growing learner.