Transient ischaemic attacks

Description

A transient ischaemic attack (TIA) is a temporary inadequacy of the circulation in part of the brain (a cerebral or retinal deficit) that gives a clinical picture similar to a stroke except that it is transient and reversible. Hence, TIA is a retrospective diagnosis. The duration is no more than 24 hours and a deficit that lasts longer than 24 hours is defined as a stroke [1] . The majority of TIAs last for less than 30 minutes.

Epidemiology

- A first ever TIA affects approximately 50 people per 100,000 of the UK population each year [1] .
- TIA is more common with increasing age. It is rare under the age of 60 years.
- It affects men more than women and black races are at greater risk.
- About 15% of first stroke victims have had a preceding TIA.

Risk factors [2] [3]

It has the same risk factors as for stroke. See also the separate Stroke Prevention article.

- Hypertension.
- Smoking.
- Diabetes mellitus.
- Heart disease (valvular, ischaemic, atrial fibrillation).
- Peripheral arterial disease.
- Polycythaemia vera.

- Carotid artery occlusion; carotid bruit.
- Combined oral contraceptive pill.
- Hyperlipidaemia.
- Excess alcohol.
- Clotting disorders.

Aetiology

It is usually embolic, may be thrombotic, and occasionally haemorrhagic (unlikely to produce a reversible lesion).

- The most common source of emboli is the carotids, usually at the bifurcation.
- They can originate in the heart with atrial fibrillation particularly, with mitral valve disease, or aortic valve disease, or from a mural thrombus forming on a myocardial infarct or a cardiac tumour - usually atrial myxoma.
- The vertebrobasilar arteries may be a source.
- Occasionally there is paradoxical embolism originating from the right side of the circulation.
- Haemodynamic TIAs are rare. There is not necessarily total occlusion of the arteries, and circulation may merely be inadequate. Sometimes spasm may be involved.

Presentation[2] [4]

Primary care responsibilities

- A validated tool such as FAST (Face Arm Speech Test) should be used in primary care to screen people with sudden onset of neurological symptoms.
- Exclude hypoglycaemia as a cause of these symptoms.

- Any person presenting with acute neurological symptoms that resolve completely within 24 hours (ie suspected TIA) should be started on aspirin 300 mg, with the first dose given immediately (unless contra-indicated).
- Any person presenting with a suspected TIA should be referred immediately and assessed urgently within 24 hours by a specialist physician in a neurovascular clinic or an acute stroke unit [1] .
- Secondary prevention in addition to aspirin should be offered as soon as possible.

History

- A TIA may last anything from a few minutes to 24 hours. The usual duration is about 10-15 minutes. Onset is over a few minutes.
- There may be changes in behaviour that are best described by a third party.

The clinical features will depend upon the part of the brain that becomes ischaemic. The majority of ischaemic events affect the carotid territory.

Carotid territory

- Symptoms are usually unilateral and most often affect the motor area, causing unilateral weakness, affecting an arm, leg, or one side of the face. There may be dysarthria.
- There may be sensory symptoms in the same areas.
- If Broca's area is involved, there will also be difficulty with speech - called Broca's dysphasia. This produces inconsistent and unpredictable errors, usually substitution, with spontaneous speech containing fewer errors. See the separate Dysarthria and Dysphasia article.
- There may be amaurosis fugax (fleeting loss of vision), a unilateral loss indicative of retinal ischaemia, usually associated with emboli or stenosis of the ipsilateral carotid artery.

Vertebrobasilar territory

- If the ophthalmic cortex is involved there will be a homonymous hemianopia that may present purely as ignoring one side of the visual field.
- There may be bilateral visual impairment.
- There may be hemiparesis, hemisensory symptoms, diplopia, vertigo, vomiting, dysarthria, dysphagia, or ataxia.
- Ask both the patient and, if possible, those around, about weakness such as a drooping face, gait, confusion, dysarthria, loss of memory, or abnormal behaviour. Fleeting symptoms may be more obvious to those around than to the patient.
- Ask about duration, intensity and fluctuation of symptoms.
- Establish whether there were any simultaneous cardiac symptoms.

NB: global symptoms by themselves (unsteadiness, dizziness, syncope) are rarely due to TIA.

In addition to enquiring about the nature of the event, there are a number of other matters in the patient's history that require examination:

- Has this happened before?
- Has there been recent surgery, especially on the heart or carotids?
- Has there been a previous stroke or any coronary heart disease?
- Is hypertension being treated?
- Is there known diabetes?
- Are there any other significant illnesses? There may be a hypercoagulable state or vasculitis such as temporal arteritis.
- If it presents in a person much younger than 60 years, has there been drug abuse, especially cocaine?

Examination

Neurological examination should be performed as for a stroke but, by the time the patient is seen, it may have reverted to normal.

- Note overall attentiveness, ability to cooperate and verbal fluency

- Examination of the pulse may reveal abnormality of rate or rhythm. The artery may feel hard and rigid.
- Check blood pressure (BP) in both arms.
- Listen for a carotid bruit at the bifurcation and at the base of the neck for a vertebral bruit. However, a bruit can occur with minimal stenosis, and significant occlusion may be silent.
- Check peripheral pulses.

Investigations

The patient will need to be referred to a specialist centre to be seen within one day but some of the investigations should be carried out before referral.

Primary care

- Check urine for glucose.
- FBC, ESR.
- U&E, fasting lipids and glucose.
- LFTs and TSH.
- ECG may show atrial fibrillation, myocardial infarction or evidence of myocardial ischaemia.
- **NB**: coagulation studies (especially in younger patients and more so in venous thromboembolism rather than arterial thrombosis) and antiphospholipid antibodies may be appropriate but are best discussed with specialists initially.

Secondary care

The Royal College of Physicians (RCP) and the National Institute for Health and Care Excellence (NICE) guidelines recommend [1] [4] :

- Patients with suspected TIA that occurred more than a week previously should be assessed by a specialist physician as soon as possible within seven days.

- Patients with suspected TIA should be assessed by a specialist physician before a decision on brain imaging is made, except when haemorrhage requires exclusion in patients taking an anticoagulant or with a bleeding disorder when unenhanced CT should be performed urgently.
- For patients with suspected TIA in whom brain imaging cannot be undertaken within seven days of symptoms, T2-weighted MRI imaging should be the preferred means of excluding haemorrhage.
- Patients with a confirmed diagnosis of TIA should receive clopidogrel (300 mg loading dose and 75 mg daily thereafter) and high-intensity statin therapy (eg, atorvastatin 20-80 mg daily) started immediately.
- Everyone with TIA who after specialist assessment is considered as a candidate for carotid endarterectomy should have urgent carotid imaging. If they have symptomatic carotid artery stenosis of 50-99%, people should:
    - Be assessed and referred urgently for carotid endarterectomy.
    - Receive optimal secondary prevention drug and lifestyle treatment.

The following are likely to be requested from the specialist service:

- Where there is suggestion of problems with the heart (including atrial fibrillation), echocardiogram may show atrial thrombus, aneurysm of the anterior wall of the left ventricle with mural thrombus, atrial myxoma or left-side valve disease.
- Cardiac monitoring may show paroxysmal atrial fibrillation.
- CT or MRI scan of the brain may show an area of reduced blood flow or an unsuspected infarct. MRI scanning tends to be more sensitive and to give better images of carotid and vertebral arteries. It may also demonstrate the rare cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL).
- It may be argued that full investigation for coronary heart disease should be initiated, as the most common cause of death after TIA is a myocardial infarction.

Differential diagnosis

- Before there is full recovery it is impossible to differentiate from a stroke.
- Intracranial lesion (tumour or subdural haematoma). Beware of diagnosing TIA if there has been loss of consciousness, or convulsion.
- Todd's paralysis:
    - Follows a seizure and is characterised by a temporary, usually unilateral, paralysis.
    - It may also affect speech or vision and usually resolves within 48 hours. The cause is unknown.
- Todd's paresis (transient weakness of a hand, arm, or leg after partial seizure activity affecting that limb) is less severe and more common than Todd's paralysis.
- Syncope due to cardiac arrhythmia.
- Giant cell arteritis (temporal arteritis) has a very high ESR; there is often thickening and tenderness of the temporal artery, and monocular, temporary visual impairment is a frequent presentation.
- Migraine, or migrainous aura.
- Retinal or vitreous haemorrhage.
- Focal epileptic seizure.
- Labyrinthine disorders.
- Transient global amnesia.
- Psychological disorders (including hyperventilation).
- Metabolic disturbance - eg, hypoglycaemia.

Features that do not fully fit for TIA are called transient neurological attacks (TNAs) [5] . The risk of subsequent stroke is not as high as for TIA [6] .

Management

Initial management of suspected and confirmed TIA [4]

- Offer aspirin (300 mg daily), unless contraindicated, to people who have had a suspected TIA, to be started immediately.
- Refer immediately people who have had a suspected TIA for specialist assessment and investigation, to be seen within 24 hours of onset of symptoms.
- Do not use scoring systems, such as $ABCD^2$, to assess risk of subsequent stroke or to inform urgency of referral for people who have had a suspected or confirmed TIA.
- Offer secondary prevention, in addition to aspirin, as soon as possible after the diagnosis of TIA is confirmed.

Secondary prevention (see below) includes the use of antiplatelet therapy, antihypertensive treatments and lipid-modifying treatments, the management of atrial fibrillation if present and the management of any other underlying or risk factors, including diabetes.

Driving [7]

Group 1 (car or motorcycle)

- Must not drive for one month.
- No need to notify DVLA after a single TIA.
- Multiple TIAs over a short period: require three months free from further attacks before resuming driving, and DVLA should be notified.

Group 2 (lorry or bus)

Licence refused or revoked for one year following a stroke or TIA.

RCP recommendations [1]

Patients with non-disabling stroke or TIA should receive treatment for secondary prevention introduced as soon as the diagnosis is confirmed, including:

- Discussion of individual lifestyle factors (smoking, alcohol excess, diet, exercise).

- Clopidogrel 300 mg loading dose followed by 75 mg daily.
- High-intensity statin therapy with atorvastatin 20-80 mg daily.
- BP-lowering therapy with a thiazide-like diuretic, long-acting calcium-channel blocker or angiotensin-converting enzyme inhibitor.

Patients with non-disabling stroke or TIA in atrial fibrillation should be anticoagulated as soon as intracranial bleeding has been excluded and with an anticoagulant that has rapid onset, provided there are no other contra-indications.

Patients with non-disabling stroke or TIA who, after specialist assessment, are considered candidates for carotid intervention should have carotid imaging performed urgently within 24 hours.

Carotid stenosis

See the separate Carotid Artery Stenosis article.

Prognosis

TIA is associated with a very high risk of stroke in the first month after the event and up to one year afterwards [1] .

Other factors associated with an increased risk of stroke include [2] :

- Increased BP (ie sustained above 130/90 mm Hg).
- Hyperlipidaemia.
- Diabetes mellitus.
- Atrial fibrillation and other cardiac arrhythmias.
- Structural cardiac disease.
- Carotid artery stenosis.
- Lifestyle factors, including smoking, exercise, eating and dietary habits, and alcohol consumption.
- A second TIA within one week.

Secondary prevention

See also the separate Prevention of Cardiovascular Disease article.

- Lifestyle advice should always include smoking cessation, weight loss if overweight or obese, and a healthy diet. Exercise should also be encouraged [8] .
- If there is atrial fibrillation or another source for systemic emboli, this must be addressed. The relative merits of the various approaches to the management of atrial fibrillation are discussed elsewhere. Anticoagulation is usually required if the rhythm cannot be converted but anticoagulants are of no value in the absence of atrial fibrillation [9] .
- Hypertension must be controlled.
- Everyone should be on antiplatelet medication of some sort.
- Diabetes, if it exists, must be well controlled.
- Hyperlipidaemia must be addressed. There is evidence that statin therapy in patients with a history of ischaemic stroke or TIA significantly reduces the risk of subsequent major coronary events but only marginally reduces the risk of stroke recurrence [10] .

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