Introduction

Transcranial ultrasound (TCD) can rapidly and non-invasively image blood flow in the major basal intracranial arteries. Its accuracy makes it acceptable for use in screening for haemodynamically significant intracranial stenosis or vessel occlusions. Although it has a relatively limited field of view and is not technically feasible in approximately 10% of cases, the information obtained is becoming increasingly relevant to therapeutic decision-making in the prevention and management of stroke. Transcranial Doppler ultrasound or transcranial colour-coded duplex have the advantages of relatively low cost, ease of repeatability, and excellent safety and tolerability, but they provide inferior spatial and anatomical detail in comparison to angiographic techniques **(Levi et al, 2001).**

Current evidence have shown that (TCD) is indicated in patients with ischemic cerebro-vascular diseases including ischemic stroke, transient ischemic attack (TIA) and may be routinely indicated in asymptomatic patients at high risk of stroke.(TCD) can detect intracranial hemodynamic derangements such as arterial stenosis, arterial occlusion, collaterals and microembolization **(Tan et al, 2005).**

The advantages of (TCD) evaluation of cerebral vessels include the fact that it is a low-cost, noninvasive bedside assessment. However, in the context of acute stroke, digital subtraction angiography (DSA), magnetic resonance angiography (MRA), and computed tomography angiography (CTA) are more commonly used. These methods are more expensive and

more time consuming and do not provide continuous blood flow monitoring **(Burgin et al, 2000).**

Transcranial Doppler ultrasound and transcranial colour-coded duplex have no recognised adverse effects, a potential advantage over X-ray angiography which carries a risk of contrast allergy and stroke, or computerised tomographic angiography that uses ionizing radiation and also requires intravenous contrast media. The ultrasound studies are well tolerated, a potential advantage over MRA which sometimes triggers claustrophobia, necessitating the use of intravenous sedation. Transcranial Doppler ultrasound and transcranial colour-coded duplex cost less than angiography, and the portability of the equipment allows the examination to be performed at the patients' bedside and at repeated intervals if necessary **(Levi et al, 2001).**

TCD like any other ultrasound-based technique is operator dependent. For this reason it should be performed and interpreted by individuals with adequate background, training and practical experience **(Tan et al, 2005)**.

The main limitation of transcranial ultrasound is the inadequacy of the acoustic window through either the temporal bone or the foramen magnum. The temporal window is more likely to be inadequate for ultrasound in women and the elderly. Up to 10% of patients undergoing transcranial Doppler ultrasound and up to 20% undergoing transcranial colour-coded duplex have inadequate acoustic windows for an optimal study. These proportions can be reduced to less than 5% with the use of intravenous transpulmonary echo-contrast drugs, however, these drugs increase the complexity and cost of the investigation **(Levi et al, 2001)**.

Investigators in previous studies demonstrated that the diagnostic accuracy of transcranial color-coded duplex US is higher than that of conventional transcranial Doppler US. With this newer method, up to 80% of angiographically diagnosed cases of mild narrowing and 92% of cases of advanced narrowing of the cerebral arteries could be properly classified **(Krejza et al, 2005).**

Advances in brain imaging techniques now allow therapeutic decisions about the acute management and prevention of stroke to be made with a detailed understanding of the nature and severity of the underlying arterial pathology **(Levi et al, 2001)**.