also of the intracranial pressure (ICP). As the ICP rises, greater resistance to flow will be encountered by the cerebral arteries. With regard to TCD monitoring, this is going to be reflected in a decrease in velocities and an increase in pulsatility. As the ICP continues to increase, resistance to flow will become even greater, to a point, where a "reverberating" waveform pattern will be noted by TCD; this pattern is associated with net blood flow, and usually implies absence of effective cerebral circulation an event associated with brain death. It is therefore possible to use TCD monitoring to detect the progression of intracranial hypertension and to document the present of cerebral circulatory arrest.

Global Cerebral Ischemia : Theoretically, it is also possible to utilize TCD to monitor the effect of systemic circulatory derangements upon the brain. An example of this is the documentation of a global decrease in end diastolic blood flow velocities (EDBFV) resulting from aortic insufficiency. Even simple bradycardia will have an effect upon the EDBFW that can be measured with TCD. Several groups have studied the TCD changes occurring during syncope, showing that a drop of approximately 50% is frequently observed as patients pass out. In any case it is important to note that when systemic hypotension occurs, complete loss of EDBFV is not tolerated by the brain and is always associated with the loss of consciousness. The use of TCD monitoring during *head up tilt tests* (HUT) has introduced a new dimension in the assessment of patients according to the principal mechanism for their event, into vasovagal, vasodepressor and "cerebral" syncope. The latter is a poorly understood condition in which, for reasons yet unknown, patients seem to develop cerebral vasoconstriction and loss of consciousness.

Some groups have been also interested in assessing the effect of cardiopulmonary resuscitation upon the cerebral circulation. The use of TCD monitoring of the internal carotid artery during CPR has shown that, in spite of all maneuvers, MBFV drop progressively and relentlessly over time. This drop seems to be the direct result of a progressive increase in resistance to flow, leading to the development of "reverberating" TCD patterns; further work in this area might disclose ways in which TCD could assist in improving the outcome of patients who suffer cardiac arrest.

DETECTION OF CEREBRAL EMBOLI

In 1990, for the first time, Spencer et al. reported the detection of asymptomatic formed emboli to the cerebral blood vessels using TCD monitoring of patients undergoing carotid endarterectomy. This report was followed by great general interest in further investigating the capability of this technique, as well as its potential clinical applications. The theoretical basis for the detection of emboli using Doppler ultrasound is actually very simple. The Doppler effect generally relies upon the frequency shift caused upon the ultrasound beam by a moving reflector, in this case the red blood cells. The intensity of the returned ultrasound depends upon the proportion of the transmitted beam that is reflected. This, in turn, depends upon the tissue through which the ultrasound passes, and the reflection from the interface between two materials. The latter is proportional to the difference in acoustic impedance compared with circulation blood, the Doppler ultrasound beam reflects readily and intensely from them, generating characteristic sounds and changes within the Doppler waveform. It is possible to utilize TCD to detect gaseous or solid embolic material. There is preliminary information to suggest that the technique may even be used to differentiate among different types of pathologic embolic material, conferring TCD monitoring a very important place in the evaluation and follow up of patients during surgical procedures, or of patients at risk of recurrent cerebral embolisation for a variety of other reasons (e.g. prosthetic heart valves, patent foramen ovale). The task of applying TCD monitoring the detection of emboli is likely to be facilitated by the development of instrumentation capable of automatically recognizing the Doppler characteristics of emboli, differentiating it from ultrasonic artifacts.

CONCLUSION

The technique of TCD monitoring is a safe and reliable method for longitudinal assessment of the status of the cerebral circulation over time. Its applications are as diverse as the imaginative efforts of the user. In general, TCD monitoring appears to have a great future, becoming more entrenched into the daily care of patients with neurological disorders. The future is yet to see even further improvements in the instrumentation and transducer utilized for TCD monitoring, perhaps adding more potential applications of this technique.

RECOMMENDED READING

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4. *Gomez CR, Backer RJ, Bucholz RD. Transcranial Doppler Ultrasound following closed head injury: vasospasm or vasoparalysis? Surg Neurol 1991; 35:30-35.*
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7. *Gomez CR, Janosik DE, Lewis LM, Transcranial Doppler Assessment of global cerebral ischemia: syncope and cardiac arrest. In Babikian V and Wechsler LR (eds) transcranial Doppler ultrasonography. Mosby – year book publishers inc. St. Louis – 1992.*
8. *Gomez CR, Lewis LM, Gomez SM et al. Transcranial Doppler Assessment of the Cerebral Hemodynamic Effect of Cardiopulmonary Resuscitation in Fatal Cardiac Arrest. J Neuroimag 1992; 2:8-11.*
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15. *Spencer MP, Thomas GI, Nicholls SC et al. Detection of middle cerebral artery emboli during carotid endarterectomy using transcranial Doppler ultrasonography. Stroke 1990; 21:4415-423.*
16. *Thie A, Spitzer K, Lachenmayer et al. Prolonged vasospasm in migraine detected by non-invasive transcranial Doppler ultrasound. Headache 1988; 28: 183-186.*

IMSA orations to be delivered in IMSACON-2008

Following orations have to be delivered in IMSACON- 2008 to be held on 12-13 October, 2008 in Dubai.

1. Dr. Pinnamaneni Narasimha Rao, International Award;
2. Dr. T.M.A. Pai oration ;
3. Mrs. Sushila and Dr. K.N. Rao Memorial oration ;
4. Dr. B.C. Bansal and Mrs. Uma Bansal oration;

BOT & CEC members and Fellows and Members of IMSA are requested to recommend names of national and international fame for delivering the above orations. The recommending persons should send biodata and achievements of the recommended persons for consideration by the Award Committee. The recommendations should reach IMSA headquarter at New Delhi by 10th May 2008.

Secretary General IMSA