The second section is dedicated to the physiology of cerebrovascular circulation and to the dynamic aspects of this circulation. In this field, parts of the major advances in TCD have been made in the last few years. The so-called functional TCD is still the topic of several studies on cognitive processing. Since modern neuroimaging techniques, such as magnetic resonance angiography, computed tomography angiography and diffusion-weighted imaging, play an increasing role in the acute management of cerebrovascular diseases, the functional TCD still has the advantage of an excellent resolution of time and thus can detect short-term changes of brain functions. This application of TCD may be one of the most important contributions to science in the next few years.

The third section gives a very practical overview on the different clinical applications of TCD in cerebrovascular diseases. Modern TCD examinations do not only allow diagnosis of stenosis or occlusion but also give valuable diagnostic help in monitoring vasospasms after subarachnoid haemorrhage or during meningitis and encephalitis, and allow evaluation of global cerebral ischaemia (e.g. in orthostatic hypertension). Unfortunately, no comments on the detection of artery dissection are included in this section. TCD is often the first method to detect intracranial dissections of the carotid or vertebral artery. Therefore, some practical guidelines for this diagnosis would have been helpful.

In the fourth section, the current knowledge of and studies on microembolic signals are described. The first chapters present the physical basics for understanding the phenomenon of microembolic signals, and convincingly concludes that microembolic signals should be interpreted with care since their real nature is still not completely understood. Consequently, the most correct term for these signals should be microembolic signals, rather than microemboli. We still do not know whether every single signal really represents a microembolus, and this is the major limitation of the method for its daily clinical use. A more established clinical use of TCD is the monitoring of patients in an intensive-care situation or during (cardio)vascular surgery, which is summarized in the fifth section. A very thorough and critical discussion within this section is dedicated to the evaluation of brain death by TCD. The author concludes that ‘the test [i.e. TCD] must not be used as the sole means of diagnosis’ (p. 196) of brain death.

In the last three sections, the new approaches and fields of TCD are presented. The transcranial colour-coded ultrasonography is briefly summarized as a method for evaluating signals from structures others than the arteries depending from the carotid arteries, e.g. arteriovenous malformations. It is a pity that no coloured figures are included in this chapter. However, colour plates are included in the next chapter on the transcranial B-mode ultrasonography. This is a very informative and instructive part of the book, which states that brain parenchyma imaging by ultrasonography is still in its infancy but also gives the possible perspectives of this new methods. An even more limited method is three-dimensional TCD, which, in the opinion of the reviewer, is presented in a too optimistic and positive manner. A new section on TCD in paediatric uses follows. This contribution was very much warranted and gives excellent information on the cerebrovascular developmental
anatomy and physiology in the infant and child with interesting and helpful anatomical pictures. Some clinical applications of TCD such as evaluation of brain death or monitoring of intensive care patients, e.g. with meningitis or sickle cell disease, show different aspects in childhood and adolescence. It is, therefore, very commendable to include this section in a general book on TCD. The last section of the book gives some brief information on contrast-enhanced TCD, which meanwhile has become a routine clinical method for patients with inadequate insonation windows.

This collection of fundamental reviews on the different aspects of TCD could well act as a reference book and as a stimulus to develop further the research on TCD. The editors provide a systematic overview with, in part, excellent and instructive figures. The extensive bibliographies at the end of every chapter together with the helpful and thorough index increase the value of the book. Every clinician and researcher dealing with TCD should be familiar with the content of this book.

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