

Vertebrobasilar Dolichoectasia: A Meta-Analysis of Clinical Manifestations and Treatment Approaches

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Description

Vertebrobasilar Dolichoectasia (VBD) is a condition characterized by the abnormal elongation, dilatation, and tortuosity of the vertebral and basilar arteries. This condition often leads to an increased risk of cerebrovascular events such as strokes, Transient Ischemic Attacks (TIAs), and even aneurysms, due to the altered blood flow dynamics caused by the vascular changes. VBD can present a variety of clinical manifestations, which often overlap with other vascular and neurological disorders, making diagnosis and treatment challenging. With its potential to cause significant morbidity, it is crucial to explore the clinical features and treatment strategies for VBD to develop a clearer understanding of the disease and inform future therapeutic approaches. A meta-analysis of existing studies can offer valuable insights into the clinical presentation of VBD and the effectiveness of various treatment modalities.

The clinical features of vertebrobasilar dolichoectasia are diverse and may include symptoms such as dizziness, vertigo, headache, visual disturbances, ataxia, and even more severe neurological deficits like strokes or cognitive impairment. These symptoms occur due to the disruption of normal blood flow in the posterior circulation, which supplies the brainstem, cerebellum, and occipital lobes. The pathophysiology of VBD involves an increase in arterial pressure, changes in wall shear stress, and the formation of microthrombi that further compromise blood flow. The meta-analysis of clinical features in patients with VBD reveals a broad spectrum of symptoms, with certain neurological deficits being more common in patients with advanced forms of the condition.

While some patients may be asymptomatic or present with only mild symptoms, others may experience debilitating events such as ischemic strokes, which are often linked to the altered flow dynamics within the affected arteries. The risk of such events is particularly heightened in individuals with large dolichoectatic vessels and other comorbidities such as hypertension, diabetes, or hyperlipidemia. Moreover, the presence of other vascular abnormalities like aneurysms or arteriosclerosis can complicate the clinical picture, necessitating a comprehensive approach to diagnosis and management.

Treatment strategies for vertebrobasilar dolichoectasia are varied and primarily aimed at managing symptoms and preventing cerebrovascular events. In many cases, medical management is focused on controlling risk factors such as hypertension, hyperlipidemia, and diabetes. Antithrombotic therapy, including the use of aspirin or clopidogrel, is often employed to reduce the risk of thromboembolic events. However, the effectiveness of these treatments in preventing strokes or other complications related to VBD is still a subject of ongoing research. A meta-analysis of treatment outcomes suggests that antiplatelet therapy may be beneficial in reducing the frequency of ischemic events, although the evidence is not entirely conclusive.

In more severe cases of VBD, when patients experience recurrent strokes or significant neurological deficits, surgical interventions may be considered. Procedures such as endovascular stenting or bypass surgery are sometimes used to address vascular abnormalities, although these approaches carry significant risks due to the complexity of the affected vascular structures. The decision to pursue surgical intervention is often based on the size and location of the dolichoectatic vessels, as well as the patient's overall health and the potential benefits of surgery. The meta-analysis highlights that while surgical strategies may offer some improvement in symptoms or reduce the risk of further strokes, their long-term effectiveness remains uncertain, with complications including restenosis or aneurysm formation sometimes arising post-intervention.

In addition to conventional treatments, emerging therapies targeting the underlying pathophysiology of vertebrobasilar dolichoectasia are being explored. These include the potential use of drugs to improve endothelial function, reduce arterial stiffness, and modulate the inflammatory response that contributes to vascular remodeling. Moreover, advancements in imaging techniques such as Magnetic Resonance Angiography (MRA) and Computed Tomography Angiography (CTA) are allowing for more precise diagnosis and monitoring of the condition, which could lead to better-tailored treatment plans for individual patients.

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The future of vertebrobasilar dolichoectasia management lies in improving early detection, refining medical treatments, and optimizing surgical strategies. Further large-scale studies and meta-analyses are needed to better understand the long-term outcomes of current treatments, particularly regarding stroke prevention and the management of vascular complications. Additionally, personalized approaches based on genetic, clinical, and imaging data may help to improve the prognosis for individuals with VBD. As research in this area continues, there is hope that a more comprehensive understanding of the condition will lead to more effective interventions and improved patient outcomes.

In conclusion, vertebrobasilar dolichoectasia presents significant challenges in both diagnosis and treatment due to its variable clinical presentation and complex vascular involvement. The meta-analysis of clinical features and treatment strategies underscores the need for ongoing research to refine management approaches and improve patient outcomes. The future of VBD treatment lies in personalized, targeted strategies that address the unique pathophysiology of the disease.

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