EARLY DETECTION AND PREVENTIVE APPROACHES TO SPINAL CORD VASCULAR DISEASES

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Abstract: Spinal cord vascular diseases are among the most severe and disabling disorders of the central nervous system. Early detection and timely preventive measures significantly improve patients' quality of life, reduce the risk of irreversible complications, and lower the incidence of disability. The aim of this study is to evaluate the main risk factors, analyze early diagnostic methods, and develop effective preventive strategies for spinal cord vascular disorders.

Keywords: spinal cord, vascular disease, early diagnosis, prevention, rehabilitation, risk factors.

Spinal cord vascular diseases constitute a serious clinical and public health challenge due to their high rate of neurological deficits and disability. These disorders occur as a result of disrupted blood flow to the spinal cord, which leads to ischemia and necrosis of neural tissues. The most common causes include arterial hypertension, atherosclerosis, diabetes mellitus, thrombosis, embolism, and spinal vascular malformations.

Early detection of such disorders is crucial for preventing irreversible damage. The identification of high-risk individuals—particularly those with cardiovascular diseases, metabolic syndrome, and chronic spinal degenerative processes—is a key step in prevention. Routine clinical evaluation, including neurological examination and functional assessments, should be complemented by advanced diagnostic methods such as magnetic resonance imaging (MRI), computed tomography (CT) angiography, and Doppler ultrasound of spinal arteries.

MRI remains the most sensitive technique for visualizing spinal cord ischemia and microvascular insufficiency. Doppler sonography allows for non-invasive assessment of spinal and vertebral blood flow, while electromyography and somatosensory evoked potentials help evaluate the degree of functional impairment. These diagnostic tools enable clinicians to detect subclinical changes long before the onset of severe neurological symptoms.

From a preventive perspective, the management of modifiable risk factors plays a decisive role. Regular control of blood pressure, maintaining optimal lipid and glucose levels, engaging in physical activity, and following a balanced diet significantly reduce the likelihood of spinal cord ischemic events. Furthermore, patient education about the early signs of vascular insufficiency—such as back pain, numbness, or muscle weakness—contributes to faster diagnosis and timely medical intervention.

In the social medicine context, preventive programs should focus on raising awareness among the general population and healthcare professionals about the importance of early screening for spinal cord and cerebrovascular health. Establishing specialized rehabilitation centers and implementing multidisciplinary care involving neurologists, vascular surgeons, and physiotherapists can enhance recovery outcomes.

The integration of advanced diagnostic technologies with public health-based preventive strategies represents an effective model for reducing the overall incidence and burden of spinal cord vascular diseases.

Conclusion

Early detection and prevention of spinal cord vascular diseases are essential components of modern neurology and healthcare systems. The use of advanced imaging technologies, combined with systematic risk assessment and public health initiatives, can substantially decrease the prevalence of these disabling conditions. Multidisciplinary collaboration, continuous patient monitoring, and active health education remain the cornerstone of effective prevention and long-term rehabilitation.

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