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Review Article

Associations and Outcomes Between Essential Hypertension and Spinal Dural Arteriovenous Fistula in Neuro-surgical Adult Patients: A Mini-Review

Dennis Adjepong, MD, MBA*

Department of Neurological Surgery, California Institute of Behavioral Neurosciences & Psychology, Fairfield, USA

Abstract

This report aims to examine the effects of hypertension associated with Spinal Dural Arteriovenous Fistula (SDAF) in adult patients. The study specifically examined the various studies which address hypertension and its clinical correlation between SDAF. It digs out data on the population variable, initial signs, and symptoms that are associated with the disease progression. According to the analysis of this survey, the victims were mostly middle-aged men. In numerous cases, hypertension was associated with SDAF was found in the mid-thoracic region. This study aims to bring to the attention of neurosurgeons the association between hypertension and SDAF. This study has proved that there is a close correlation between the progression of hypertension and SDAF.

Keywords: Arteriovenous fistula; Hypertension; Spinal dural arteriovenous fistula

Introduction

Spinal Dural Arteriovenous Fistula (SDAF) is the most common spinal vascular malformation that is under diagnosed among the general population [1-3]. Magnetic Resonance Imaging (MRI) findings, such as spinal cord edema and dilated tortuous veins play a pivotal role in the confirmation of the diagnosis. An angiogram of SDAF at different locations along the spinal column mimics serpentine perimedullary venous plexus on MR imaging. This disease is most common among older men and is characteristically found around the thoracolumbar region of the body [4-7]. The treatment options include open clinical ligation, endovascular embolization, or other multi-modality treatment. This study presents diagnosis assessments and clinical implications for the treatment of SDAF [4,8,9].

***Corresponding author:** Dennis Adjepong, Department of Neurological Surgery, California Institute of Behavioral Neurosciences & Psychology, Fairfield, USA, Tel: +1 5712771998; E-mail: adjepongdennis1@gmail.com

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Method

This research method was adopted by reviewing medical journals written and analyzed the sources about SDAF. The information gathered from healthcare journals was sorted out to develop a proper understanding of SDAF. Medical journals from the PubMed database were queried with keywords like spinal dural arteriovenous fistula, hypertension, and arteriovenous fistula. The results of the search were sorted out to build a complete understanding of the subject matter under discussion.

Results

Of the 80 patients that were studied, it was found out that 66 of them were men representing 83% [4]. Besides, the average age of the period of the initial symptom was 57.6 years [1,2,4]. From the whole population, only a single patient was below the age of 30 [4]. At the time of their judgment, the median age of the patient was 60.1 years [4,10-12]. According to the study, it is evident that SDAF primarily affects men at the age of 50 years. Most of the patients were above50 years at the time of diagnosis of the disease [4,13-15]. The most striking finding in our study was that; patients were often associated with hypertension because the veins of such individuals have been compromised by various factors of the disease [16].

Discussion

Pathophysiology& diagnosis of SDAF

SDAF is a condition that is acquired; the exact cause and etiology remain unknown. The Arteriovenous (AV) shunt is usually positioned inside the dural mater near by the spinal nerve roots where the arterial plasma from the artery that supplies the nerve root and the meninges are located [8,16]. This is why the condition is normally associated with hypertension among the patients and also affects mostly those above the age of 50 [8,17,18]. The increase in spinal venous pressure results in diminishing arterialization of the AV pressure gradient. It often results in the decrease in pressure of the spinal veins and the conventional outflow of the venous fluid [5,8,13].

Patients suspected of SDAF are screened with myelography before spinal angiography [1,17,19-22]. Typically, findings include prominent vessels beading of the cauda equine [23-25]. Computed tomography is an efficient method of localizing high-resolution images and reducing the time required for angiography [7,23,24]. MRI and catheter angiography techniques are more critical in the confirmation

of the diagnosis when there is clinical suspicion of progressive myelopathy [1-3].

Genetics

There is little information that links SDAF to genetics. However, it is believed that changes in the disorder occurring in the same lineage are more prominent compared to an individual who has never had a history of the disease.

Clinical implication

The initial symptoms are venous congestion, which is non-specific and includes difficulty in climbing stairs, gait disturbance, and excruciating pain in both lower limbs. Most patients encounter moderate back pain without significant disorders [25-29]. Such neurologic symptoms are progressive with time and ascend in nature [29-31]. Spinal Dural Arteriovenous Fistula (SDAF) is the most popular form of vascular abnormality of the spine. It is usually associated with hypertension, especially among the patient with ages above 50 [26,27,32]. The prognosis of this disease depends on the neurological deficit that is generally experienced. Diagnosis of the condition is specifically tricky due to the various clinical features which are not in any way specific [26,27,29].

Scientific Analysis

In conducting this research, the two major article which was included, the Ying Jeng et al. and Sato. However, the first article by Ying Jenget at al. was considerably more rewarding and appropriate for the study. This is due to the fact it was more detailed and had a lot of information which informed this study the most. Even though the second article was also very essential for the study, the first one did tell much of the study element with clearly articulated research and in-depth analysis of the survey [32,33].

Conclusion and Treatment of SDAF

Untreated SDAF progresses to serious morbidity and causes irreversible disability [1-3]. Treatment options for SDAF include endovascular embolization and ligation of the fistula [25-28].

Spinal Dural Arteriovenous Fistulas (SDAFs) may occur anywhere there is a dural or meningeal covering around the brain or spinal cord. Clinical manifestations include venous hypertension, non-disabling tinnitus to focal neurological deficits, seizures, hydrocephalus, psychiatric disturbances, and developmental delay in the pediatric patient. SDAF is an uncommon but curable sequel that needs emergent treatment, or else advanced paraplegia ensues. Then euro radiologic stage is vital for the discovery of these lacerations [25,33,34]. Also, their management should be intended to block the proximal section of all veins with the form of a distal arterial section [18,35-37]. Vital signs are undefined; however, the Magnetic Resonance Imaging trials of string edema is diagnostic [38-45].

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