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Dates: Received: 05 July, 2017; **Accepted:** 07 August, 2017; **Published:** 08 August, 2017

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Keywords: Intracranial sinus thrombosis; Anticoagulants; Low-molecular-weight heparin; Acenocumarol

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Observational Study

The Epidemiology and Prognosis of Cerebral Venous Sinus Thrombosis in a Third Level Hospital

Abstract

Objectives: To analyze several characteristics of patients with cerebral venous sinus thrombosis in a third level hospital and to find any factors that could be related to poor progress.

Materials and methods: A retrospective study was carried out of patients hospitalized from 2000 to 2014 and diagnosed with cerebral venous sinus thrombosis.

Results: 55 patients with an average age of 30.2 years old were included in the study. 73.1% had an associated risk factor. 72.7% received anticoagulation treatment during the acute phase, while 67.2% received long-term anticoagulation treatment for an average period of 5.3 months. 58.1% of patients developed complications deriving from the disease itself, 5.4% died, therefore no statistically significant association was found with any of the variables studied.

Conclusions: Cerebral venous sinus thrombosis is a rare entity. This series, the patients were young, with a very high rate of complications (58%), although with low mortality (5%), which prevented us from finding factors associated with a bad prognosis..

Abbreviations

CVT: Cerebral Venous Thrombosis; MRI: Magnetic Resonance Imaging; CT: Computerized Tomography; LMWH: Low-Molecular-Weight Heparin; UHF: Unfractionated Heparin; EFNA: European Federation of Neurological Associations; ACCP: American College of Chest Physicians

Introduction

Cerebral venous thrombosis (CVT) is a rare condition and is less frequent than other cerebrovascular accidents, can be more difficult to diagnose and is very serious. Due to the generalized use of magnetic resonance imaging (MRI) and the increased clinical awareness, CVT is more and more frequently recognized.

Owing to its many causes and ways of presenting itself with a varied clinical spectrum, CVT is a condition that can be found not only by neurologists and neurosurgeons, but also by internists, oncologists, hematologists, obstetricians, pediatricians, and family doctors. Many cases have been related to inherited and acquired thrombophilias, pregnancy, puerperium, infections and malignant tumors.

If the cause is known it must be treated accordingly. And the convulsions and the intracranial hypertension should also be treated. The antithrombotic treatment with anticoagulation in the initial phase and long term is essential.

There are very few written case studies involving patients with this pathology, which makes it difficult to know of the best way to manage this thrombosis. Here we present a series of 55 patients with CVT in a third level hospital.

Materials and Methods

This is a retrospective study of patients admitted to hospital due to CVT by the different services (Neurology, Neurosurgery, Hematology, Internal Medicine, Pediatrics, Gynecology, and Intensive Care) of Virgen de la Arrixaca University Hospital from 2000 to 2014.

Demographic data such as age and sex, as well as diagnostic imaging tests used such as brain computerized tomography (CT), MRI, and brain phlebography were reviewed. The data regarding risk factors associated with cerebral venous thrombosis, as well as present comorbidities, classified according to the system affected, were analyzed. The risk factors used were: neoplasia, puerperium, infections of the

central nervous system or its surroundings, other distant infections, Behçet's disease, systemic lupus erythematosus, antiphospholipid syndrome, any surgery during the previous 2 months, estrogenic treatment, presence of disseminated intravascular coagulation, history of traumatic brain injury, cyanogenic congenital heart disease, Wegener's granulomatosis, polycythemia and/or thrombocytosis state, sickle cell anemia, nephrotic syndrome, or hereditary coagulopathy; among the comorbidities studied were hypertension, diabetes mellitus, dyslipidemia, toxic habits (smoking and alcohol consumption), obesity, and group pathologies (heart, pulmonary, digestive, urologic, reproductive, neurological, psychiatric, rheumatic, endocrine, hematological, oncological, infectious, and neonatal diseases). The data on acute and long-term treatment as well as its duration and complications were also analyzed. The events registered during follow-up were hemorrhage, thrombotic recurrence, intracranial hypertension, cognitive alterations, epilepsy, coma and death. A binary logistic regression analysis was performed, using the "Enter" method to include variables in the model.

Results

A total of 55 patients were included, of which 19 (33.7%) were men and 36 (66.3%) women, with an average age of 30.2 (0-73) years old. The most used diagnostic method was MRI, which was used in 18 (32.7%) cases. 73.1% of patients had an associated risk factor, oral contraceptive treatment being the most frequent with 14 (25.4%) patients. Among the comorbidities, appearing in 47 (83%) patients, the most frequent were related to alterations in the central nervous system (23.6%), followed closely by smoking (21.8%). 72.7% of patients underwent acute treatment, low-molecular-weight heparin (LMWH) being the most frequently used, in 18 (33%) cases, followed by 10 (17.5%) cases where unfractionated heparin (UFH) was used; in 67.2%, a long term anticoagulant treatment was used, acenocumarol being the most frequent, in 25 (45%) patients, with an average duration of 5.3 (0.5-20) months. In this series, complications appeared in 32 (58.1%) cases, cerebral hemorrhage and intracranial hypertension being the most frequent, both appearing in 22 (40.62%) cases. 3 (5.4%) patients died. Logistic regression analysis was not statistically significant in any case, $p > 0.05$ in all estimated models, mainly due to the small number of events in the progress of the patients.

Discussion

There are no high-quality epidemiological studies on CVT, although available data suggest that it is not very frequent [1]. The different series published show an incidence of between 2-2.4/100.000 inhabitants a year [2]. This thrombosis is more common in women than in men, with a ratio of 3:1; this may be due to the increased risk associated with pregnancy, puerperium and oral contraceptives [1]. This prevalence among females can be found among young adults (but not among children or

older adults), who also seem to have a better prognosis [1,2]. In our study, a mainly female population was included, which is consistent with other publications.

In previous publications, over 85% of patients have been proven to have at least 1 risk factor [1]. Such risk factors can be classified into septic and aseptic [1]. The most frequent ones are: prothrombotic conditions (either inherited or acquired), oral contraceptives, pregnancy and puerperium, malignancy, infections, head lesions, and mechanical precipitants [1,2]. This study proves a prevalence of the risk factors similar to the prevalence in other series, ours being 73.1%, and there is a high prevalence of contraceptives as the main risk factor in CVT onset.

The immediate targets in the treatment of CVT are recanalizing the occluded sinus or vein, preventing the thrombus from spreading, and treating the underlying prothrombotic state, thus preventing other thrombus from appearing in other parts of the body as well as avoiding their recurrence [1]. For this, both in the short and in the long term, the main treatment option is anticoagulation therapy, either parenterally (UFH or LMWH) or per os (acenocumarol or direct oral anticoagulants) [3-5]. In our series, the most frequently used acute treatment was LMWH, while in chronic cases the treatment was acenocumarol. These data confirm what is stated in the guidelines of the European Federation of Neurological Associations (EFNA) on CVT treatment, where it is recommended that these patients, if there are no contraindications for anticoagulation therapy, should be treated with LMWH or UFH [5]. It is also consistent with the recommendations of the American College of Chest Physicians (ACCP), which suggest anticoagulation during the acute and chronic stages of CVT, therefore UFH or LMWH can be used as initial treatment even when there is hemorrhage inside a venous infarction [4]. When the patients are stable, we can move on to anti-vitamin K drugs, which are usually taken for a period of 3 to 6 months, a similar period to that recorded in our series [3,4].

In conclusion, we can say that cerebral venous sinus thrombosis patients in our hospital are a rare entity. These patients are usually young, with a very high rate of complications (58%), although with low mortality (5%). The rate of anticoagulant treatment was below 70% both in the acute stage and in long-term treatment, a figure that should be higher according to the latest guidelines of the different scientific societies.

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Citation: Galian Ramrez JD, Salazar VR, Torrecillas LG, Valderrama SO, Hernandez Contreras ME, et al. (2017) The Epidemiology and Prognosis of Cerebral Venous Sinus Thrombosis in a Third Level Hospital. *Arch Hematol Case Rep Rev* 2(2): 016-018.