Valvular lesions and Epilepsy, Khartoum, Sudan 2018

Khabab Abbasher (✉ khabab9722@gmail.com)

University of Khartoum Faculty of medicine <https://orcid.org/0000-0003-4608-5321>

Radi Tuffaha AlHusseini

Al zaeim Alazhary University Faculty of medicine

Amira Sidig

El Nelain University Faculty of medicine

Mutaz F. Digna

University of Khartoum Faculty of medicine

Abbasher Hussien

University of Khartoum Faculty of medicine

Hussien Abbasher

AlYarmouk college

Mohammed M. Aldar

Omdurman teaching Hospital

Omer Eladil

International University of Africa Faculty of medicine

Khalid Hajnoor

Mediclinic Hospital, Abu Dhabi/UAE

Mohammed Abbasher

EL Nelain University Faculty of medicine

Research Article

Keywords: Epilepsy and valves, Epilepsy and heart

Posted Date: October 6th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-86438/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Valvular lesions and Epilepsy, Khartoum, Sudan 2018 (Daoud Research Group, Khartoum, Sudan)

AbasharM.Hussein, Amira Sidig, Mohammad M.Aldar, Kh. Hajnoor, Omer Eladil, Khabab A. Hussien, Radi Tofaha AL-Husseini, Hala M. Osman, Hussein abbashar, Mohammed Abbasher, Abdallah.M.A, Mutaz F. Digna, Mohamed S. Munner

Corresponding author :

Khabab A. Hussien
Khabab9722@gmail.com
00249907712134

Keywords :

Epilepsy and valves/Epilepsy and heart

Abstract

Introduction: Epilepsy is either; idiopathic when there is no underlying cause or secondary if there is an underlying cause of egg brain tumors, stroke. There is a strong in conjunction between epilepsy and valvular lesions. **Objective:** To study the relationship between valvular lesions and Epilepsy among Sudanese epileptic patients. **Methodology:** Almost 50 Sudanese patients with valvular lesions were included in the study during Jane 2018 to Jane 2019. **Result:** Out of 50 patients (48%) males while females (52%). Almost 40% of the patients were found to have generalized tonic colonic epilepsy, while 60% have focal epilepsy. Pure MS was the common valvular lesion observed. 14% of the patients had atrial fibrillation, especially with mitral stenosis .4% of the patients underwent valvotomy. Abnormal EEG was observed in 64% of the patients. Abnormal brain MRI was detected in 50% of the patients. Almost all the patients 100% diagnosed as having valvular lesions before being diagnosed with epilepsy. **Conclusion:** There is a strong relationship between valvular lesions and epilepsy, most probably due to association with coexist arrhythmias resulting in cerebral infarction, tight valvular lesions, and rarely follow valvotomy valvular replacement.

Introduction:

Epilepsy is a prevalent neurological disease. ¹A seizure is a sudden disruption of the brain's regular electrical activity accompanied by altered consciousness and other neurological and behavioral manifestations. Epilepsy is characterized by recurrent seizures. Clinically Epilepsy is divided into two basic categories, generalized and focal.²⁻³ In generalized epilepsy, the abnormal electrical discharges occur throughout the brain, whereas focal epilepsy only affects a specific region of the brain. Generalized tonic-clonic epilepsy is the most dramatic. Other examples of generalized epilepsy are absence ("petit mal") epilepsy, atypical absence, tonic, clonic, atonic and myoclonic. Focal epilepsy is either focal with impairment if there is an associated loss of consciousness or focal without impairment if there is no loss of consciousness. ⁴⁻⁵ Both types of focal epilepsy, when they become generalize, are called focal to bilateral. Epilepsy is either; idiopathic if there is no underlying cause or secondary to an underlying cause of egg brain tumors, stroke. ⁶⁻⁷

The heart has four valves that control blood flow in the correct direction, including the mitral valve, tricuspid valve, pulmonary valve and aortic valve. Valvular heart disease may present at birth (congenital) or in adults due to many causes and conditions, such as rheumatic heart diseases. Heart valve problems may include regurgitation, stenosis and atresia. ⁸

The etiology of the epileptic seizures with valvular lesions although is well recognized, but it is not so clearly understood. Most researchers thought that seizures among patients with valvular lesions are associated with cardiac arrhythmia causing cerebral.⁸ Atrial fibrillation is the most prevalent cause of arrhythmia associated with cerebral infarctions. Almost 10% of patients with mitral stenosis tend to have atrial fibrillation, so the incidence of cerebral infarction and seizure increases among patients with mitral stenosis. ⁹ Atrial fibrillation can occur in patients with other valvular lesions rather than mitral stenosis, but to less extent. There is a well know recognize association between seizures and tight mitral stenosis.¹⁰ Also, the incidence of epilepsy increased among patient underwent valvotomy. ¹⁰

Objective:

To study the relationship between valvular lesions and Epilepsy among Sudanese patients seen in Al-shaab Teaching Hospital and Ibrahim Malik Teaching Hospital in a

period of two years from June 2018 to June 2019.

Methodology:

This is a prospective, descriptive cross-sectional hospital-based study. It was conducted in Al-shaab Teaching Hospital and Ibrahim Malik Teaching Hospital in a period of two years from June 2018 to June 2019. Al Shaab Teaching Hospital is a tertiary hospital located in the center of Khartoum town. There are five cardiac units with 43 beds and three cardiac surgery units with 30 beds; there are three intensive care units, five cardiac referred clinics, and three cardiac surgery referred clinics each week. Ibrahim Malik Teaching Hospital is a tertiary hospital located in the center of Khartoum town. It is a big center in Sudan for neurology and neurosurgery. There are three neurological units and two neurosurgical units. Almost 50 Sudanese patients with valvular lesions were included in the study during the period June 2018 to June 2019.

Data collection and analysis:

Data were collected by the authors using questionnaires retrieving pieces of information from patients. A full detailed history was taken from each patient; the history included: Age, Sex, origin, symptoms of weakness, numbness convulsion and other symptoms related to CNS (disturbance of high cerebral function, sphincter defects, cranial nerves involvement). Cardiac symptoms like chest pain, chest tightness, palpitation, dyspnea, orthopnea, right hypochondrial pain and lower limb swelling. History of fever, weight loss, sweating. Past medical history of cardiac surgery, including valvular replacement or valvotomy. Drug history, family history and social history were included. Proper systemic and neurological examinations were performed for each patient by the authors. The following Investigations were done for patients: urine analysis, hemoglobin, TWBC, ESR, renal function test, serum protein, brain MRI, EEG and Echocardiography. The data was introduced in the computer from a master sheet recording using a software program. Then the authors analyzed the data, and the results were expressed.

Inclusion criteria:

- (1) Sudanese patients with valvular lesions seen or admitted during the period of the study,
- (2) Those who agreed to participate in the study.

Exclusion criteria:

(1) Non-Sudanese patients.

(2) Opposing patients who declined to participate in the study.

All patients gave verbal or written consent to participate in this study. The local ethics committee approved the study.

Results:

Out of 50 patients (48%) males while females (52%). The most affected age group was 10-20 years, represents 34%. Almost 40% of the patients were found to have generalized tonic clonic epilepsy. In comparison, 60% have focal epilepsy (24% focal without impairment, 36% focal with impairment.) .34% of the patients were found to have pure MS, 14% of the patients have double valve MS+ MR, 6% have MS+ AF, another 6% have MR+MS+AF,6% have MR+AR+AS,4% have TR+MR+AR+AS 2% with pure MR 2% have MS+MR +pulmonary hypertension. Also, 2% have MS+ MR+ TR+ AF + pulmonary hypertension, 2% have TR+MR, 2% have MS+AR+AS, 2% have TR+MR+AR, 2% have MS+MR+AS+AR, congenital heart disease was found in 12% of the patients (6% were VSD and 6% were ASD), only 4% of the patients underwent valvotomy. Abnormal EEG was observed in 64% of the patients. Abnormal brain MRI was detected in 50% of the patients. Almost all the patients 100% diagnosed as having valvular lesions before being diagnosed with epilepsy. 14% of the patients have atrial fibrillation, especially with mitral stenosis.

DISCUSSION:

There is a strong relationship between epilepsy and valvular lesions. Valvular lesions can cause epilepsy through a coexistent thromboembolic phenomenon, leading to cerebral infarction that precipitates an attack of seizures; these occurred commonly in patients with valvular lesions and atrial fibrillation.¹¹ Mitral stenosis is well known as the most prevalent valvular lesion associated with atrial fibrillation(almost 10%).¹² embolism from mitral stenosis is most likely to occur with the onset of atrial fibrillation which favors the formation of a clot in the left atrium. Hence embolism may occur with tight mitral stenosis and high atrial pressures, mainly if there is extreme rigidity or calcification of the valve where clots may form and be detached "even if the rhythm is regular and there is no operative interference. There is a strong relation between balloon valvuloplasty and embolic stroke and seizures.¹³ During the procedure of valvoplasty embolization; calcified material is released. During the procedure of valvoplasty, the seizure

may occur as a result of exuberant dosing of lidocaine.¹³

Thrombo embolic phenomenon, to less extent, can occur in patients with mitral valve prolapsed and mitral incompetence. The incidence of thromboembolism in patients with mitral incompetence increase when there is concomitant mitral valve stenosis. Mitral annular calcification can cause stroke independent of atrial fibrillation.¹⁴

Aortic stenosis and aortic incompetence can cause a cerebral infarction, primarily when associated with another emboli source, such as mitral valve diseases.¹⁵

Increase the risk of stroke and subsequent seizures among patients with mechanical valves who used to take anticoagulant.¹⁶

There is a strong relationship between infective endocarditis and seizure due to embolization of septic materials, rupture of mycotic aneurism and formation of cerebral abscess.¹⁷

From the analysis of the results of interictal EEGs done for 50 Epileptic patients, 64 % showed abnormal EEGs; out of this, 40 % had generalized discharge, and 60% had a focal discharge. Our findings did not differ much from what was reported worldwide.¹⁸ These figures might have been a little bit higher if it was not for patients delay in having EEG recording (I.e., delay > 48 hours). There was no real difference in the gender distribution of abnormal EEGs. Sleep deprivation EEG recording within 48 hours of a seizure and seizure frequency of at least one attack per month are all known to increase the chances of finding epileptic disorders. The inability to have EEG recording within the first 48 hours was due to practical difficulties, as quite a number of our patients were referred from distant Sudanese states and districts. We think the prospect for the future is to do a second recording (during sleep) for every patient with a negative EEG; This is hopefully will increase the chance of obtaining more positive EEGs. The study showed that most of the patients with generalized epilepsy had a normal MRI of the brain (90%); This is because generalized seizures are more often the result of associated metabolic factors, hypoxia, or medications; this result is similar to studies done worldwide.¹⁹ The brain's incidence of abnormal MRI increased to 50% among patients with focal epilepsy because it usually results from localized infarction, hemorrhage or abscess.

Conclusion:

There is a strong relationship between valvular lesions and epilepsy most properly due to association with coexist arrhythmias, tight valvular lesions, associated cerebral infarction, and rarely it may follow valvotomy or valvular replacement.

REFERENCES:

- (1) BS Chang, DH Lowenstein. Epilepsy. *N Engl J Med* 2003; 349 (13): 1257-66.
- (2) Nair RR, Thomas SV. Genetic liability to Epilepsy in Kerala State, India. *Epilepsy Res.* 2004;62:163–170.
- (3) Kjeldsen MJ, Corey THE, Christensen K, et al. Epileptic seizures and syndromes in twins: the importance of genetic factors. *Epilepsy Res.* 2003;55:137–146.
- (4) Hennric Jokeit, Simone Bosshardt and Victoria Reed. A Comparative Approach to Interictal Memory Disturbances in Patients with Epilepsies: *Epileptologie* 2011; 28: 164-176.
- (5) Hussein A, Abdulgalil A, Omer F, Eltoum H, Hamad A, El-Adil O, et al. Correlation between Serum Level of Antiepileptic Drugs and their Side Effects. *Oman Med J.* 2010 January; 25(1): 17–
- (6) Ohaeri JU, Awadalla AW, Farah AA. Quality of life in people and their family caregivers. An Arab experience using the short version of the World Health Organization quality of life instrument. *Saudi Med J* 2009; 30: 1328-1335.\
- (7) Penovich PE, Eck KE, Economou VV. Recommendations for the care of women with epilepsy. *Cleveland Clinic Journal of Medicine* 2004; 71(Suppl 2):S49.
- (8) ADAMS MJ. Multiple calcific embolism following mtral valvotomy. *Br Heart J.* 1961 May;23:333–336. [PMC free article] [PubMed] [Google Scholar]BAILEY CP, OLSEN AK,
- (9) KEOWN KK, NICHOLS HT, JAMISON WL. Commissurotomy for mitral stenosis; technique for prevention of cerebral complications. *J Am Med Assoc.* 1952 Jul 19;149(12):1085–1091.
- (10) BAKER C, BROCK RC, CAMPBELL M, WOOD P. Valvotomy for mitral stenosis; a further report, on 100 cases. *Br Med J.* 1952 May 17;1(4767):1043–1055.
- (11) BAKER C, HANCOCK WE. Deterioration after mitral valvotomy. *Br Heart J.* 1960 Apr;22:281–294.
- (12) BAKER CG, FINNEGAN TR. Epilepsy and mitral stenosis. *Br Heart J.* 1957 Apr;19(2):159–163.
- (13) BANNISTER RG. The risks of deferring valvotomy in patients with moderate mitral stenosis. *Lancet.* 1960 Aug 13;2(7146):329–333.
- (14) BELCHER JR. Restenosis of the mitral valve: an account of fifty second operations. *Lancet.* 1960 Jan 23;1(7117):181–184.
- (15) BELCHER JR, GUPTA RL. RESTENOSIS OF MITRAL VALVE:

A STUDY OF 100 CASES TREATED BY OPERATION. Br Med J. 1964 Apr 4;1(5387):871–875.

(16) BELCHER JR, SOMERVILLE W. Systemic embolism and left auricular thrombosis in relation to mitral valvotomy. Br Med J. 1955 Oct 22;2(4946):1000–1003.

(17) FLEMING HA, WOOD P. The myocardial factor in mitral valve disease. Br Heart J. 1959 Jan;21(1):117–122.

(18) Berkovic SF, McIntosh A, Howell R. Familial temporal lobe epilepsy: A common disorder identified in twins. Ann Neurol 1996; 40:227-235.

(19) Lüders H, Acharya J, Baumgartner. Semiological seizure classification. Epilepsia 1998; 39:1006-1013.