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Vascular Malformations In Late Onset Epilepsy

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Abstract:
Background*: Arteriovenous malformations and cavernomas can be complicated by epilepsy at any time in their development, even outside of a complication. The epilepsies due to these malformations are variable. The objective of our study was to determine and analyse vascular of late onset epilepsy in the Algerian population.*
Materials and Methods*: The study population includes all Algerian patients whose age of onset of the first seizure is 25 years or more, recruited during the period from January 2008 to December 2016 at ALI AIT IDIR Hospital in Algiers.*
Results: *In our study, we find that the arteriovenous malformations represent (19 cases).The distribution by age groups shows that arteriovenous malformations are dominant in the group of subjects (25-29 years).*
Conclusion: *Our study confirms the presence of vascular malformations in the etiologies of late onset epilepsy, represented by arteriovenous malformations with a percentage of 9.7%.*
Key Words*: Late onset epilepsy, Vascular malformations, Arteriovenous malformations, Algerian population.*

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I. Introduction

Vascular malformations include: ruptured aneurysms with cerebral haemorrhage,arterio-venous malformations and cavernomes.

Aneurysms are not involved in the constitution of epilepsy except when they crack and rupture with the constitution of an intracerebral hemorrhage.

Epilepsy due to an aneurysm with intracerebral hemorrhage has the same characteristics as epilepsy occurring after a hemorrhagic stroke.

Cavernomas and arteriovenous malformations are rarer vascular causes, and are the cause of drug-resistant epilepsy.

Arteriovenous malformations and cavernomas can be complicated by epilepsy at any time in their development, even outside of a complication. The epilepsies due to these malformations are variable: single seizure, absence of seizures under treatment, drug-resistant epilepsy.

The introduction of CT and brain MRI has increased the frequency of brain malformations in the category of subjects whose age group is between 25 and 44 years old. It goes from less than 10% for the period 1935 – 1984 in the survey carried out by (Hauser et al, 1993) [1] up to a rate of 20% in the epidemiological study carried out by (Annegers et al, 1999) [2].

1. Arteriovenous malformations:

Arteriovenous malformations are revealed by an epileptic fit in a third of cases; the parietal and temporal localizations are the most epileptogenic, the seizures are generalized in 50% of the cases, bravais-jacksonian in 30% and temporal in 20% of the cases. CT scan with contrast injection or MRI probably identifies the vast majority of epileptogenic arteriovenous malformations; the smallest lesions can theoretically escape these explorations and only be visualized in angiography.

2. Cavernous angiomas or cavernomas

They are common and are present in 0.1 to 0.5% of patients. Cavernous angiomas are either quiescent and sometimes asymptomatic, incidentally discovered, or revealed by epilepsy, cerebral hematoma or, more rarely, a pseudotumor syndrome; 45% of cavernous angiomas are revealed by generalized or partial epilepsy; purely epileptogenic cavernous angiomas have a low hemorrhagic risk. The use of the T2 gradient echo is

essential in order to confirm the diagnosis and to search for multiple locations; CT scans are useful for assessing the calcified component.

3. Venous angiomas or anomalies of venous development

They are frequent (1 to 5% of individuals); they are discovered fortuitously and in the vast majority of cases remain asymptomatic. The association with a cavernous angioma is possible and must be systematically sought by T2 sequences in gradient echo; such an association is likely to explain an epileptic seizure. The epileptogenic character of an isolated venous angioma is unlikely, the dilation of the venous angioma during efforts could nevertheless be evoked.

II. Material And Methods

The study population includes all Algerian patients whose age of onset of the first seizure is 25 years or more, recruited at ALI AIT IDIR Hospital in Algiers.

Inclusion criteria:

1. The age of the patients must be greater than or equal to 25 years at the time of inclus.
2. Patient presenting with his first epileptic seizure at the age of 25 years or older.
3. Clinically and electrically confirmed diagnosis of epilepsy.

Exclusion criteria:

1. Age less than 25 years

III. Results

Our study population includes 336 patients, recruited during the period from January 2008 to December 2016. This figure corresponds to the number of patients selected according to the inclusion criteria.

Etiological diagnosis:

Table 1. Etiological diagnosis in the study population

	Cases	%
Cerebral lesion	196	58,3
No detectable cause	140	41,7
Total	336	100

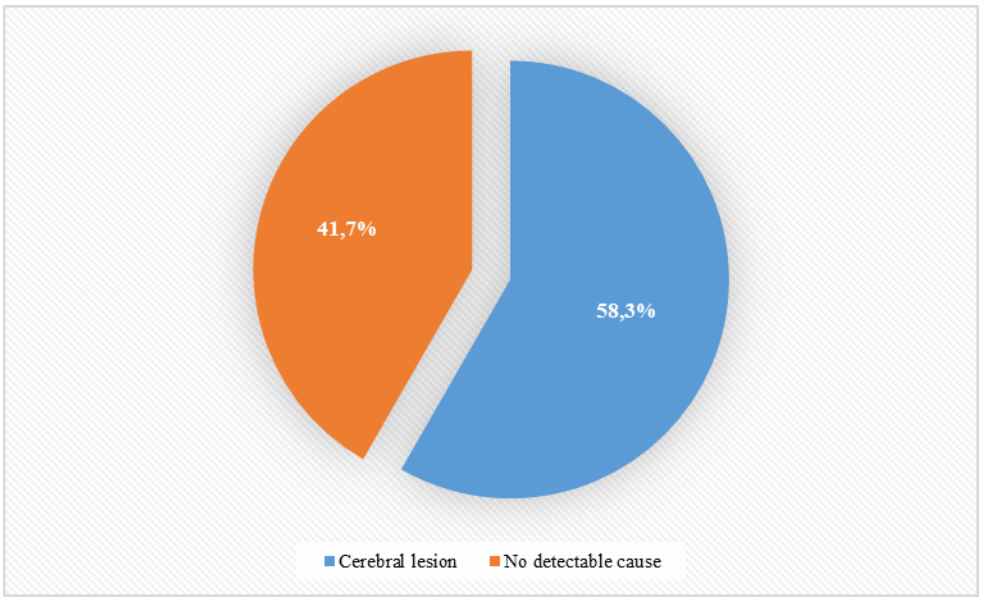

Figure 1. Frequency of cerebral lesion in the study population

A cerebral lesion was found in approximately 58.3% of cases (196 cases).

Table 2. Distribution of cerebral lesion by age group

	Cerebral lesion		**No detectable cause**	
	Cases	%	Cases	%
25-29 years	16	5	30	9
30-34 years	27	8	19	6
35-39 years	26	8	23	7
40-44 years	16	5	12	3
45-49 years	21	6	6	2
50-54 years	17	5	9	3
55-59 years	15	4	10	3
60-64 years	17	5	6	2
65-69 years	14	4	6	2
70-74 years	12	3	9	3
75-79 years	10	3	6	2
80 years and over	5	1	4	1
Total	**196**	**57**	**140**	**43**

The distribution by age group shows a predominance of cerebral lesion for all age groups except for the group of subjects aged (25-29 years) where the patients had no detectable cause.

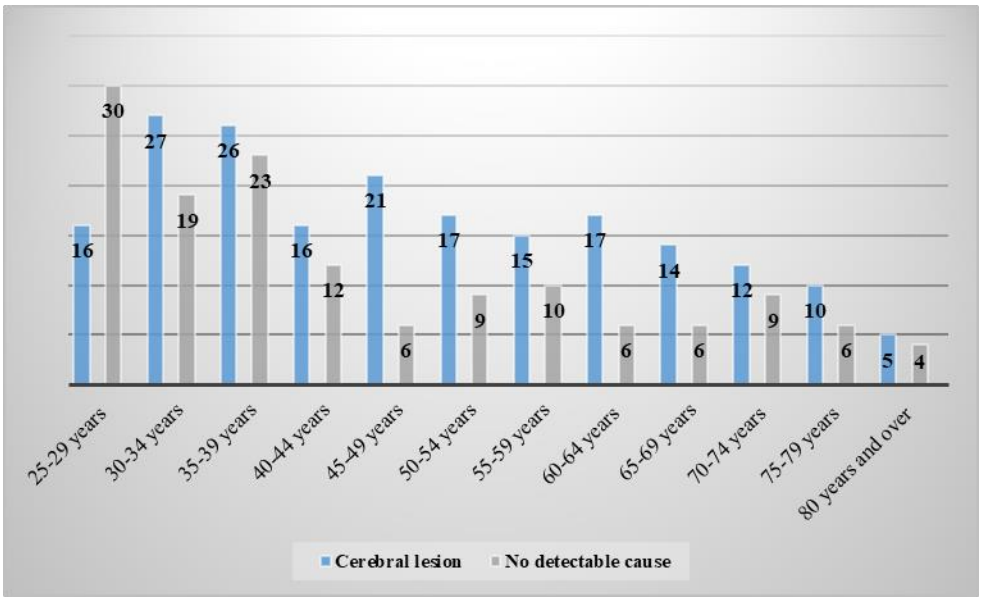

Figure 2. Distribution of cerebral lesion according to age groups

2. Vascular malformations:

Table 3. Arteriovenous malformations in the study population

		Cases	**%**
Other cerebral pathologies		56	16,6
Inflammatory			
	Multiple sclerosis	15	4,5
	Neuro-Behçet's disease	5	1,5
	Neurolupus	1	0,3
	Mixed connective tissue disease	1	0,3
Brain arteriovenous malformations		19	5,6
Basal ganglia calcification		1	0,3
Mesial temporal sclerosis		5	1,5
Cerebral venous thrombosis		7	2
Arachnoid cyst		2	0,6
Total		**336**	**100**

In our study we find that the arteriovenous malformations (19 cases), are well represented behind the inflammatory pathology.

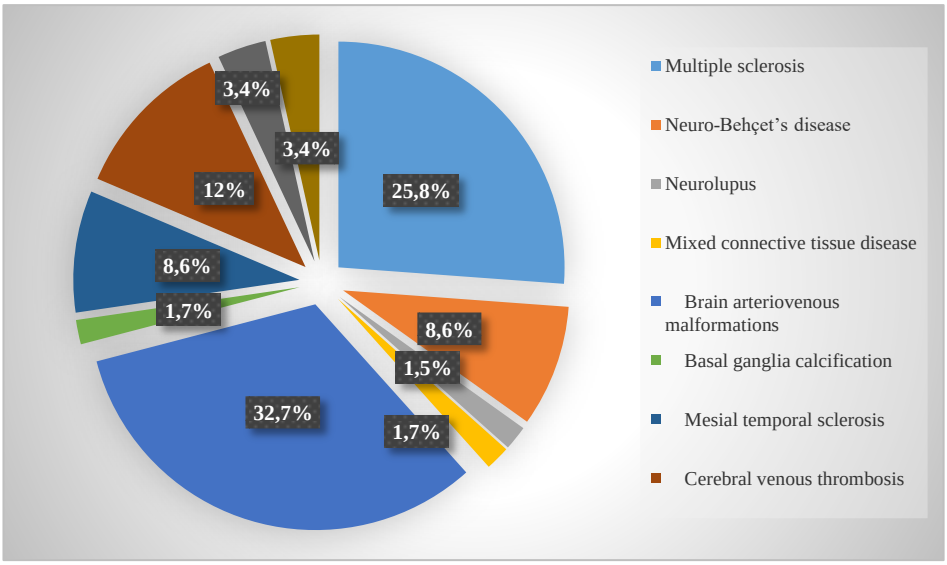

Figure 3. Frequency of arteriovenous malformations in the study population arteriovenous malformations represent 9.7% of cases.

Table 4. Arteriovenous malformations by age group

	Arteriovenous malformations
25-29 years	5
30-34 years	3
35-39 years	3
40-44 years	2
45-49 years	3
50-54 years	1
55-59 years	1
60-64 years	0
65-69 years	1
70-74 years	0
75-79 years	0
80 years and over	0
Total	**19**

The distribution by age groups shows that arteriovenous malformations are dominant in the group of subjects (25-29 years).

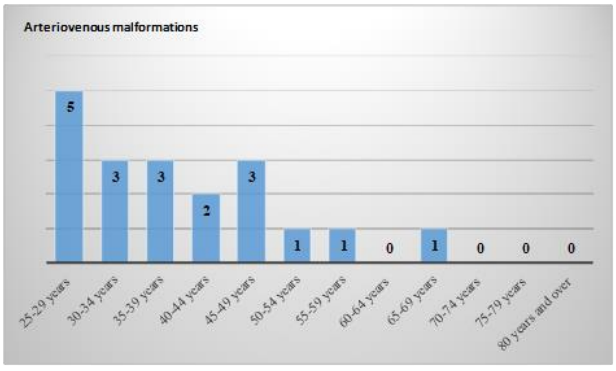

Figure 4. Distribution of arteriovenous malformations according to age groups

IV. Discussion

A cause was found in 58.3% of cases. This situation has been observed in several studies (José Luis Perez Lopez, 1985 [3] - Roberto Suastegui et al, 2009 [4] - Lars Forsgren, 1990 [5]) with respectively 50.8%, 51%, and 49%.

Our study confirms the place of vascular malformations represented by arteriovenous malformations 9.7%.

In terms of distribution by age group: it is especially in the group of subjects from (25-29 years) that the arteriovenous malformation was dominant.

Our results agree with data from the literature. Basim Ayaqub and Panayiotopoulos, 1987[6], reported the main causes including arteriovenous malformations with a percentage of 5%.

In our study, arteriovenous malformations represent 9.7% of cases. This result is consistent with data from the literature (CGY Fong et al, 2003 [7]). 2.6%.

Table 5. Literature review of arteriovenous malformations in late onset epilepsy

Study	Country	Arteriovenous malformations
José lwis Perez Lopez, 1985	Spain	ND
Agnete Mouritzen Dam, 1985	Denmark	ND
R.Sridharan et al, 1986	Libya	ND
Basim A.Yakoub et al, 1987	Saudi Arabia	5%
Anthony Hopkins et al, 1988	United Kingdom	ND
Lars Forsgren, 1990	Sweden	ND
Daniel Arbaiza 1995	Peru	ND
Lars Forsgren et al, 1996	Sweden	ND
Marcelo Rigatti et al, 1999	Brasil	ND
Andre Oun et al, 2003	Estonia	ND
GCY Fong et al, 2003	Hong Kong	6%
David Ortega Rivero et al, 2003	Ecuador	ND
Christian Napon et al, 2009	Burkina Faso	ND
Robero Suastegui et al, 2009	Mexico	ND
Ewan Hunter et al, 2012	Tanzania	ND
Sudhir Chasani et al, 2015	India	ND
Our series	Algeria	9.7 %

V. Conclusion

On the etiological level, our study confirms the presence of vascular malformations in the etiologies of late onset epilepsy, represented by arteriovenous malformations with a percentage of 9.7%. Arteriovenous malformations are dominant in the group of subjects (25-29 years).

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