

Variable arachnoid cyst presentations in variable age groups; a comparative single center study

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Abstract

Introduction. Arachnoid cysts are an intracranial spaces that are filled with cerebrospinal fluid (CSF) and lined with arachnoid membranes. They may be asymptomatic or present with focal epilepsy, headache and other neurological symptoms.

Purpose. This study shows the different presentation of brain arachnoid cysts in relation to their locations in variable age groups.

Methods. This is a retrospective analytic cohort comparative study that enrolled 168 patients was done in the Middle Euphrates Neuroscience Center and Al-Sadder Medical City, from the first of February 2020 to the first of February 2023. The collected data of patients include patient's age, gender, presentation, location of the cyst in the brain and its dimension. Each patient was assessed a full general and neurological examination. The data were analysed according to presentation and location of cyst in the brain via MRI.

Results. The mean age of group one is 10 years (4-18 years) and for group two is 35 years (19-70 years). Regarding the gender, the male gender was more in group one, while the female gender was more in group two than in group one. Regarding the presentation, the most common presentation is focal epilepsy in about 47.61% in both groups and more in group one (about 68.11%). Regarding the MRI location of arachnoid cyst, the most common site was the temporal lobe. The overall percentage of arachnoid cyst is 57.14% in temporal lobe and 13.09% in occipital lobe in total patients

Conclusion. The arachnoid cysts of brain are variable in both their presentations and their locations in different ages. The most common presentation is focal epilepsy in patient 18 years old and less, while the headache in patient older than 18 years. The most common site of cyst is temporal lobe.

Keywords: Arachnoid cyst, epilepsy, headache, temporal lobe, focal epilepsy, Neuroscience

Introduction

Arachnoid cysts are non-malignant, intracranial spaces that are filled with cerebrospinal fluid (CSF) and lined with arachnoid membranes [1, 2]. It can be classified into primary (due to separation of the arachnoid membranes in utero, resulting in the development of anomalous collections of CSF) or secondary cysts (due to trauma, surgery, infection, or intracranial hemorrhage) [3]. Arachnoid cysts accounts 1% of all intracranial space-occupying lesions. The prevalence in adults is approximately 1.4% with a female preponderance, while the prevalence in children is 2.6% [4]. The signs and symptoms of arachnoid cysts vary according to their size and location. It may be usually asymptomatic, requiring observation and follow up. However, larger cysts can have a mass effect and neurological symptoms [5]. Headaches are the most common symptom, accounting for a share of 66% [6]. Other symptoms include dizziness, nausea, vomiting, worsening of mood, mental status changes, ataxia, seizures, and hearing loss [6]. Most common their location are supratentorial and found in the middle fossa [7]. The remainder may occur in the cerebellopontine angle, suprasellar and quadrigeminal cisterns, cerebral convexities, and cisterna magna [8].

This study shows the different presentation of brain arachnoid cysts in relation to their locations in variable age groups.

Method

This is a retrospective analytic cohort comparative study that enrolled 168 patients was done in the Middle Euphrates Neuroscience Center and Al-Sadder Medical City in Al-Najaf City, Iraq, from the first of February 2020 to the first of February 2023.

The collected data of patients include patient's age, gender, presentation, location of the cyst in the brain and its dimension. The patients were divided into two groups, group one (18 years and below, 69 patients) and group two (above 18 years, 99 patients). Each patient was assessed by age, gender, history, full general and neurological examination. Then, the investigations have been taken which include basic blood tests, CXR, brain MRI and some patient underwent chest CT scan with contrast. The data were analysed according to presentation and location of cyst in the brain via MRI. All cases with multiple cysts or secondary cysts are excluded from the study.

The oral consent was taken from all patients and data between each group was analysed and statistically compared using Microsoft Excel version 2009. The data were given as numbers, mean and percentage.

Results

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The mean age of group one is 10 years (4-18 years) and for group two is 35 years (19-70 years).

Regarding the gender, the male gender was more in group one, while the female gender was more in group two than in group one as in table (1) below.

Table (1): age and sex distribution in both groups.

Parameters	18 years and below	Above 18 years
Mean age (years)	10	35
Gender	Male 60 (86.95%) Female 9 (13.03%)	Male 57 (57.57%) Female 42 (42.42%)

Regarding the presentation, the most common presentation is focal epilepsy in about 47.61% in both groups and more in group one (about 68.11%). The second most common symptom is headache in about 42.85% of cases and more in group two (about 56.56%). The least symptoms are development delay, ataxia and ADHD (about 0.59%) and these are present only in group one. As in table (2) below.

Table (2): Variable presentations in both studied groups.

Presentation	18 years and below	Above 18 years	Total
Focal epilepsy	47 (68.11%)	33 (33.33%)	80 (47.61%)
Headache	16 (23.18%)	56 (56.56%)	72 (42.85%)
Dizziness	2 (2.89%)	4 (4.04%)	6 (3.57%)
Speech abnormalities	2 (2.89%)	0	2 (1.19%)
Development delay	1 (1.44%)	0	1 (0.59%)
Head tremor	3 (4.34%)	0	3 (1.78%)
Paresthesia	1 (1.44%)	9 (9.09%)	10 (5.95%)
Cognitive impairment	2 (2.89%)	0	2 (1.19%)
Ataxia	1 (1.44%)	0	1 (0.59%)
ADHD	1 (1.44%)	0	1 (0.59%)
Total patients	69	99	168

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Regarding the MRI location of arachnoid cyst, the most common site both groups is temporal lobe (50.72%) in group one, while in group two is (61.61%). The second most common site in group one is frontal lobe (15.94%), while in group two is occipital lobe (15.15%). The overall

percentage of arachnoid cyst is 57.14% in temporal lobe and 13.09% in occipital lobe in total patients as in table (3) below.

Table (3): various locations of arachnoid cyst in both groups.

MRI location	18 years and below	Above 18 years	Total
Frontal lobe	11 (15.94%)	7 (7.07%)	18 (10.71%)
Temporal lobe	35 (50.72%)	61 (61.61%)	96 (57.14%)
Parietal lobe	2 (2.89%)	2 (2.02%)	4 (2.38%)
Occipital lobe	7 (10.14%)	15 (15.15%)	22 (13.09%)
Fronto-temporal	1 (1.44%)	1 (1.01%)	2 (1.19%)
Fronto-parietal	5 (7.24%)	0	5 (2.97%)
Cerebellum	2 (2.89%)	0	2(1.19%)
Retrocerebellar area	0	8 (8.08%)	8 (4.76%)
Basal cistern	0	5 (5.05%)	5 (2.97%)
Inter-ventricular	3 (4.34%)	1 (1.01%)	4 (2.38%)
Cerebella-pontine angle	2 (2.89%)	0	2 (1.19%)
Sylvian fissure	0	2 (2.02%)	2 (1.19%)
Sphenoidal area	0	1 (1.01%)	1 (0.59%)
Associated chest.	0	2 (2.02%)	2 (1.19%)

Discussion

Arachnoid cysts are non-malignant intracranial spaces that are classified into primary or secondary cysts and it accounts 1% of all intracranial space-occupying lesions [1-3]. This is an analytic comparative study that include two groups according to their ages, 18 years and below and those above 18 years.

The age of presentation of arachnoid cysts is different and range from newborns to the elderly and the males tend to be affected more than females. The mean age of group one is 10 years (4-18 years) and for group two is 35 years (19-70 years) [9]. The male gender was more in group one (86.95% was male in group one and 57.57% was male in group two), while the female gender was more in group two than in group one (13.03% was female in group one and 42.42% was female in group two) [9, 10]. All the cysts were single, and all multiple cysts were excluded. There are 22 patients in both groups have family history of arachnid cyst. These findings are similar to both studies of Al-holou and his co-authors [10, 11]. In our study, there is no patient included less than 4 years because missed diagnosis by paediatrician, so not

referred to neurology center , in addition to, difficulty of diagnosis and less availability of brain MRI at that age.

The most common presentation is focal epilepsy in about 47.61% in both groups (68.11% in group one and 33.33% in group two), The second most common symptom is headache in about 42.85% of cases (23.18% in group one and 56.56% in group two). The least symptoms are development delay, ataxia and ADHD (about 0.59%) and these are present only in group one. These findings are similar to Katzman GL et al and Al-holou et al studies [10, 11].

The overall percentage of arachnoid cyst is 57.14% in temporal lobe and 13.09% in occipital lobe in both groups. The most common site both groups is temporal lobe (50.72%) in group one, while in group two is (61.61%). The second most common site in group one is frontal lobe (15.94%), while in group two is occipital lobe (15.15%). The arachnoid cysts are more present within the left hemisphere than the right without identified cause [5, 12]. The most common site in the adult is the middle cranial fossa or Sylvain fissure (50-60%). Infratentorial arachnoidcysts are usually found within the cerebellopontine angle or retrocerebellar area and comprise 10% of arachnoid cysts, this location can be seen in the pediatric population [12-15]. They may be found in the suprasellar region in children in under 10% and even less commonly within the spine [16, 17].

Conclusion

The arachnoid cysts of brain are variable in both their presentations and their locations in different ages. The most common presentation is focal epilepsy in patient 18 years old and less, while the headache in patient older than 18 years. The most common site of cyst is temporal lobe.

Disclosure

None

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