



# Leaving Against Medical Advice Among Patients With Brain Tumours in the Middle East: Khoula Hospital Experience

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## Abstract

**Background:** Leaving against medical advice (LAMA) can be defined broadly as a patient's insistence upon leaving the hospital against the treating team has expressed advice, which is both a challenge and concern for physicians, as these patients lost to follow-up, and their outcomes remain unknown. There is no previous study conducted to find the prevalence and causes of LAMA in brain tumors patients in the Middle East to the best of our knowledge.

**Methods:** Patients studied in this research are those who were diagnosed with any type of brain tumors and were admitted to the Neurosurgical Department in Khoula Hospital (KH) but signed LAMA in the two years between January 2017 to December 2018 by going through the electronic medical records. Data obtained from the health information system includes socioeconomic characteristics, health status-related data, diagnosis-related data, and the reasons for LAMA.

**Results:** A total number of 302 patients with brain tumors included in this study. Twenty-eight patients (9.2%) signed LAMA with a majority of those who signed LAMA were in the young adult's group (3-39 years) and represented 18 (64%). Eight patients (28.57%) among the LAMA group and 43 patients (15.69%) in the non-LAMA group have tumors in the frontal lobe, which has found to be the most familiar location (29%). There was a significant relationship between the reason for LAMA and gender ( $P=0.020$ ).

**Conclusion:** Younger patients, male, Omani, newly diagnosed tumors, and tumors in the frontal lobe were all risk factors for LAMA. Education and awareness about LAMA recommended in order to avoid readmission and loss of follow up.

**Keywords:** Tumor, Brain, leaving, Medical Advice, Oman, LAMA

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## Introduction

Brain and spinal tumors contribute to the main bulk of neurosurgery work in any neurosurgical center.<sup>1</sup> The term "brain tumors" refers to a mixed group of neoplasms originating from intracranial tissues and the meninges with degrees of malignancy ranging from benign to aggressive.<sup>2</sup> In Oman, the latest report from the National Oncology Centre and the Ministry of Health (MoH) reveals that 1314 cancer cases registered in 2012, of which 92.2% were Omani of which leukemia was the most common cancer among children.<sup>3</sup> A recent study conducted at Khoula Hospital (KH) in Oman showed

1419 patients admitted to the Neurosurgery Department in 2017,<sup>1</sup> of which cranial and spinal tumors accounted for 9.6%. Out of those, thirteen patients signed, leaving against medical advice (LAMA). The study emphasizes the incidence of brain tumors in a sector of the population compared to the data revealed by other studies.<sup>1</sup> The same study found that meningiomas are making the bulk of it and medulloblastomas remaining the common pediatric tumors.<sup>1</sup>

LAMA can be defined broadly as a patient's insistence upon leaving the hospital against the expressed advice of the treating team.<sup>4</sup> Patients who leave against medical

advice are both a challenge and concern for physicians, as these patients have lost to follow-up, and their outcomes remain unknown.<sup>5</sup> Leaving the hospital against the physician's advice may expose the patient to the risk of inadequately treated medical problems resulting in the need for readmission.<sup>6</sup> It reflects a failure of the consensus and understanding between the attending physicians and the patient regarding the need for continued hospitalization.<sup>7</sup> LAMA is not an uncommon request from family members of patients with brain tumors in Oman in the Neurosurgery Department. The phenomenon of LAMA is world-wide, including both rural and urban hospitals.<sup>4,5,7</sup> The incidence of LAMA ranges from >20% in large urban hospitals, especially alcoholics, drug abusers to <4% in small rural hospitals, and medical admissions.<sup>7</sup> Most of the published data are from retrospective analyses and case-control studies at single urban institutions.<sup>6</sup> The predictors of LAMA fall within two broad categories; the patient variables which include socio-demographic characteristics, diagnosis, treatment history, behavior; and attitudes toward treatment and the second category is the provider variables including hospital setting and structure, staffing patterns, admission and discharge policies, and physicians' clinical style and experience.<sup>8</sup>

To the best of our knowledge, no previous study has conducted to find the prevalence and causes of LAMA in brain tumor patients in our region. This research aims to study the prevalence and causes of LAMA in the Neurosurgery Department at KH in Oman.

## Materials and Methods

### Study Group and Sample Size

Patients diagnosed with any type of brain tumor and admitted to the Neurosurgical Department in KH between January 2017 and December 2018 were identified as the target population. Patients have then categorized into two groups (LAMA group and non-LAMA group). These data obtained from the electronic medical records in the hospital information system (HIS). Inclusion criteria were patients with any brain tumor who left against medical advice, of any nationality, and any age. Patients with extra-cranial tumors (i.e., spinal tumors, skull tumors), who were offered treatment abroad by the treating team or those who were seen only in the clinic and refused admission and treatment excluded from this study.

### Data Collection

A retrospective data collection was conducted by reviewing records available in the hospital's electronic medical records (Health Information System, HIS). These include socioeconomic characteristics (nationality, age, gender, (nationality, age, gender, marital status, health insurance, distance from treating hospital), health status-related data (co-existing comorbidities, history of

smoking, alcohol, drug abuse or psychiatric disorders) and diagnosis-related data (time of diagnosis with a brain tumor, location of the tumor, length of hospital stay, the treatment proposed and follow up plan). Reasons for LAMA identified and obtained from the HIS by looking through the medical records for all included patients.

### Data Analysis

The research database was analyzed and processed using the Statistical Package for the Social Sciences (SPSS. v21 Inc, Chicago, Illinois, USA). Continuous variables were expressed as mean  $\pm$  SD. Chi-square test was used to obtain the significance of the association between categorized variables, using a *P*-value of  $\leq 0.05$  as the cutoff for significance. The ANOVA test was used for variables with a normal distribution pattern to test the significance of differences between the means of the groups. The association between length of hospital stay and reason for LAMA with other variables among LAMA cases was tested with Pearson  $\chi^2$  test.

## Results

The demographic information of all neurosurgical patients with brain tumors admitted to KH between January 2017 and December 2018 is shown in Table 1. A total number of 302 patients with brain tumors included in this study. Twenty-eight patients signed LAMA with Omani patients accounting for 93% ( $n=26$ ). The majority of those who signed LAMA (64%,  $n=18$ ) were in the young adult group (3-39 years). Among patients in the LAMA group, 19 patients were male, and nine were female. Twenty-three cases newly diagnosed with brain cancer, and five were known to have brain cancers diagnosed before that admission. Eight patients (28.57%) among the LAMA group and 43 patients (15.69%) in the non-LAMA group have tumors in the frontal lobe, which have found to be the most familiar location.

As illustrated in Table 2, 15 patients were less than 35 years of age, and 9 patients were older than 35 years. In the LAMA group, the majority of cases were male (71%), and the most common presentation was symptoms of raised intracranial pressure (ICP) (54%). Common sites for brain tumors in the LAMA group were the Frontal lobe followed by the parietal lobe accounted for 29% and 21%, respectively. Nineteen patients (79%) stayed in the hospital for less than one week. The most common reasons for signing LAMA were preferring treatment abroad (54%) and refusing surgical intervention (25%). Out of the 28 patients in the LAMA group, fifteen patients (63%) lost to their follow up after signing LAMA, and eight patients (33%) were treated abroad and attended for follow up with Neurosurgery Unit at KH.

As illustrated in Table 2, 15 patients were less than 35 years of age, and nine patients were older than 35 years. The majority of LAMA cases were male (71%), and the

**Table 1.** Demographic Information of Included Patients With Brain Tumour Admitted to Khoula Hospital Between January 2017 to December 2018

Variables	LAMA (n=28)		Not LAMA (n= 274)		P Value	
	No.	%	No.	%		
Nationality	Omani	26	93	246	90	1.000
	Non-Omani	2	7	28	10	
Age	(Mean - SD)	(39.6- 21.3)		(34- 18.7)		
Age	Neonate (0-2)	0	0	3	1	0.253
	Young adults (3-39)	18	64	125	46	
	Middle-age adults (40-59)	7	25	85	31	
	Old adults (older than 60)	3	11	61	22	
Gender	Male	19	68	146	53	0.165
	Female	9	32	128	47	
New/Old	New	23	82	232	85	0.784
	Old	5	18	42	15	
Location	Frontal lobe	8	28.57	43	15.69	0.237
	Sellar/suprasellar	3	10.71	38	13.87	
	Temporal lobe	1	3.57	36	13.14	
	Parietal lobe	3	10.71	22	8.03	
	Posterior fossa	2	7.14	15	5.47	
	CPA	0	0.00	16	5.84	
	Cerebellar	0	0.00	15	5.47	
	Multiple	3	10.7	12	4.38	
	Skull base	1	3.57	14	5.11	
	Pituitary gland	1	3.57	11	4.01	
	Occipital lobe	1	3.57	9	3.28	
	Other	0	0.00	9	3.28	
	Ventricular system	2	7.14	5	1.82	
	Brain stem	0	0.00	6	2.19	
	Thalamic	2	7.14	3	1.09	
	Not determined	0	0.00	4	1.46	
	Basal ganglia	0	0.00	2	0.73	
	Clivus bone	0	0.00	2	0.73	
	Pineal gland	1	3.57	1	0.36	
	Third ventricle	0	0.00	2	0.73	
	Fourth ventricle	0	0.00	1	0.36	
	Hypothalamic	0	0.00	1	0.36	
	Intraventricular	0	0.00	1	0.36	
Optic nerve	0	0.00	1	0.36		
Petro-clivus	0	0.00	1	0.36		
Optic area	0	0.00	1	0.36		
Sphenoid bone	0	0.00	1	0.36		

Initial diagnosis	Meningioma	3	10.71	53	19.34	0.000
	Pituitary adenoma	1	3.57	37	13.50	
	Glioblastoma	3	10.71	33	12.04	
	Not determined	14	50.00	16	5.84	
	Metastasis	1	3.57	27	9.85	
	Others	0	0.00	19	6.93	
	Astrocytoma	0	0.00	18	6.57	
	Oligodendroglioma	2	7.14	11	4.01	
	Ependymoma	0	0.00	8	2.92	
	Glioma (not determined)	0	0.00	8	2.92	
	Schwannoma	0	0.00	8	2.92	
	Craniopharyngioma	1	3.57	6	2.19	
	Medulloblastoma	1	3.57	6	2.19	
	Craniopharyngioma	1	3.57	4	1.46	
	Chordoma	1	3.57	2	0.73	
	Lymphoma	0	0.00	3	1.09	
	Neurocytoma	0	0.00	3	1.09	
	Gangliocytoma	0	0.00	2	0.73	
	Teratoid/rhabdoid	0	0.00	2	0.73	
	Anaplastic oligodendroglioma	0	0.00	1	0.36	
	B-cell lymphoma	0	0.00	1	0.36	
	Choroid plexuses carcinoma	0	0.00	1	0.36	
	Dermoid	0	0.00	1	0.36	
Ganglioglioma	0	0.00	1	0.36		
Ganglioma	0	0.00	1	0.36		
Germinoma	0	0.00	1	0.36		
Gliosarcoma	0	0.00	1	0.36		

Note. Location of the lesion is based on radiological report or operation notes.

SD: standard deviation, CPA: cerebellopontine angle

most common presentation was symptoms of raised ICP (54%). The frontal lobe accounted for 29% of the LAMA cases, followed by the parietal lobe (21%). Nineteen patients (79%) stayed in the hospital for less than one week. The most common reasons for signing LAMA were preferring treatment abroad (54%) and refusing surgical intervention (25%). Fifteen patients (63%) lost their follow up after signing LAMA, and eight patients (33%) were treated abroad and came for follow up in the same hospital.

The association between the age and the treatment received shown in Table 3. There was no significant relationship between treatment type and age groups. There was no difference in the treatment outcome concerning the average age for both LAMA and non-LAMA group. Association of various variables with the frequency of LAMA and their relative significance are illustrated in Table 4 (age, gender, nationality, initial diagnosis, location, outcome, and prior LAMA) among LAMA cases by using Pearson  $\chi^2$  test. The results revealed that there was a significant relationship between the reason for LAMA and gender ( $P = 0.020$ ). However, there was no relationship between the reason for LAMA or

**Table 2.** Analysis of LAMA Cases

		No.	%
Age (y)	Less than 35	15	63
	35 and more	9	38
Gender	Male	17	71
	Female	7	29
Nationality	Omani	22	92
	Non-Omani	2	8
Presenting complain	Hight ICP symptoms	13	54
	Convulsions	11	46
Initial diagnosis	Brain tumor	19	79
	Stroke	2	8
	Seizure disorders	3	13
Location	Frontal	7	29
	Temporal	1	4
	Parietal	5	21
	Pituitary	2	8
	Third ventricle	2	8
	Thalamus	2	8
	Pineal	1	4
	Multiple	2	8
	Other	2	8
Length of hospital stay	Less than one week	19	79
	Week and more	5	21
Reason for LAMA	Refusing surgical intervention	6	25
	Prefer treatment abroad	13	54
	For family discussion	3	13
	Not mentioned	2	8
Outcome	No follow up	15	63
	Received treatment abroad and came for follow up	8	33
	Re-admitted for treatment	1	4

ICP: intracranial pressure

length of hospital stay with the other variable.

## Discussion

KH is one of the three tertiary hospitals in Oman, and it is considered a leading center in neurosurgical services at the national level, with around 1400 patients admitted per year, 10% of which diagnosed with brain and spinal tumors.<sup>9</sup>

A recent local audit conducted at KH found that 34% of the patients have not operated because they signed LAMA. It has found that patients who leave against medical advice require increased care resources as they often return with worsening clinical status.<sup>1</sup> Thus a good knowledge of reasons for signing LAMA can improve the approach to such population. A cross-sectional study conducted at 4 hospitals in Iran found that 5.6% of all patients admitted to the Emergency Departments in one month self-discharged against medical advice.<sup>10</sup> Another retrospective study carried out in pediatric wards at the Royal Hospital, Oman, found that out of 11482 regular

discharges, there were 183 cases of LAMA (prevalence: 1.6%).<sup>11</sup>

Our study showed that LAMA incidence among patients with brain tumors was significant (9.2%). Moreover, most of the patients were young adults (3-39 years) and males in both LAMA and non-LAMA groups. Most of the included cases newly diagnosed with the frontal lobe being the most common location (84.4% and 16%, respectively). About 18.5% of the studied cases diagnosed with meningiomas.<sup>1</sup>

Younger patients, male, Omani, newly diagnosed tumors, and tumors in the frontal lobe were all risk factors for LAMA. These findings regarding age and gender are in concordance with results from previous studies in the literature.<sup>12-16</sup>

The results showed that despite Omani patients receiving free treatment, they were still signing LAMA more than non-Omani, which lined with other studies in this region. This may be because of the presence of influence from society or relatives outside the Omani hospital that might be lacking for those non-Omani.<sup>16</sup> Our study found that the most common presentation of LAMA patients was symptoms of high ICP (headache, nausea, vomiting, and vision changes) followed by convulsions. Most of our patients who signed LAMA found to have tumors in the frontal lobe. However, there was no data from previous studies to compare these findings.

The length of hospital stay has consistently skewed toward shorter stays, with 79% of LAMA patients staying in the hospital for less than a week.<sup>12,14</sup> On the contrary, other studies have found that more extended hospital stays

**Table 3.** AVONA Test Between Age and Treatment Received (Both LAMA and Non-LAMA Cases)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	774.236	1	774.236	1.741	0.188
Within Groups	133412.708	300	444.709		
Total	134186.944	301			

**Table 4.** Association Between Lengths of Hospital Stay and Reason of LAMA With Others Variables Among LAMA Cases

Variables	Length of Hospital Stay (P Value)	Reason for LAMA (P Value)
Age	0.615	0.322
Gender	1.000	0.020
Nationality	0.380	0.605
Presenting complain	0.630	0.402
Initial diagnosis	0.667	0.908
Location of the tumor	0.817	0.317
Reason for LAMA	0.540	-
Outcome	0.838	0.302
Prior LAMA	1.000	0.823

are more associated with LAMA since longer hospital stays increase the likelihood that patients with a strong desire to leave the hospital do so against medical advice.<sup>17</sup> When looking into the reasons patients left against medical advice, we found that most preferred to receive their treatment abroad. This preference has supported by the results of a questionnaire study conducted by Al-Hinai et al in 2011, which showed that neurological diseases were the second most common type of disease in Omani patients traveling abroad for treatment.<sup>18</sup> The reasons for medical travel by Omani patients suggested has attributed to long delays in public healthcare facilities, fewer competitive private facilities, the high cost of private medical services, and leisure facilities offered alongside healthcare treatments by some private facilities in some countries.<sup>19</sup> This finding has not seen in other studies where reasons like personal and family reasons or dissatisfaction with the hospital surgeries were the main reasons behind signing LAMA.<sup>10, 20</sup>

All patients who signed LAMA in our hospital have given follow up appointments. However, most of LAMA patients in our study lost to follow up after discharge. This is consistent with previous studies, which showed that these patients are at high risk for poor follow-up care for unresolved medical issues. In addition, self-discharged patients are at high risk for readmissions with resultant longer hospital stays and, ultimately, higher costs of care.<sup>12</sup> However, in our study, only 4% of patients were re-admitted after discharge, and this can be because patients went abroad for receiving treatment and came back for follow up in another neurosurgical institute here in Oman other than KH. In fact, many patients seek a second opinion or different consultations from other doctors in different hospitals until they get satisfied with the treatment plan.

We included age, gender, nationality, presenting complaint, initial diagnosis, location of CNS lesion, and LAMA's prior history of studying the different variables that may affect the decision to sign LAMA. Additional variables have observed to be involved in other similar studies such as length of hospital stay, insurance, and socioeconomic status, the hospital's region (urban vs. rural), marital status, and race. These variables are highly related to the background of each study cohort. For instance, insurance status can not apply in our study as the medical expenses in KH were covered by the government for Omani patients. Furthermore, a study conducted in Saudi Arabia reported that admission during the period of Eid Al-Adha (Muslim's Holiday) was significantly associated with an increased risk for discharge against medical advice,<sup>16</sup> which highlights that not only demographic but also cultural factors should consider in the study of predictive factors for the decision of LAMA.

According to Kishore, younger age, male gender,

people without medical insurance, low socioeconomic status, alcohol, and drug abuse, psychiatric problems form the risk-factors for LAMA.<sup>21</sup> However, in our study cohort, the only gender was significantly associated with signing LAMA, and there was no association between LAMA and other pre-admission factors, including health insurance, distance from treating hospital, and co-existing comorbidities.

Following other literature, we found that the male gender is significantly associated with signing LAMA.<sup>15</sup> However, a large study conducted in neurological patients in India reported that women are more at risk for LAMA.<sup>22</sup> They have attributed this finding to the fact that their patients' characteristics are different from those described in previous literature.

Unlike the results of our study, several studies have concluded that younger age has correlated with a higher rate of LAMA.<sup>12,15,23</sup> Similarly, shorter length of hospital stay and urban hospitals has reported associated with LAMA.<sup>12</sup>

There are no clinical, regulatory, or professional standards that specify the designation of LAMA in most hospitals. However, physicians need to spend more time with the patient before signing LAMA. Better communication skills may influence the patient's decision making regarding leaving the hospital. Providing all available options to the patient is considered one of the patient's rights. Moreover, patients should be aware of the consequences of leaving the hospital against medical advice and the need to stay in the hospital for further investigation and treatment, especially with patients diagnosed with brain tumors. Hospitals need to create a protocol for dealing with such events. Make patients aware of the protocol from the time of admission or even at the emergency department. Monthly audits and regular follow-ups for patients who signed LAMA need to consider in our hospital.

### Limitations

The study has conducted as a retrospective and in a single-center—more centers needed to be involved in the future with larger sample size. The follow up in our study was limited. Moreover, it was difficult to compare the current study's variable with previously published articles due to differences in the targeted population and the lack of similar articles in the literature.

### Conclusion

The incidence of LAMA among patients with brain tumors was not negligible and presented a significant issue. Younger patients, male, Omani, newly diagnosed tumors, and tumors in the frontal lobe were all risk factors for LAMA. LAMA presents a challenging and concerning experience for physicians, and more education and awareness have recommended avoiding readmission and

loss of follow up.

#### Conflict of Interest

None.

#### Ethical Statement

This study was approved by the Research Ethics Committee, Directorate General of Khoula Hospital, Ministry of Health, Muscat, Oman (Approval code: PROO 102019044).

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