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Pilot Study on Role of Family History of Epilepsy and Consanguinity in Yemeni Epileptic Patients

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Abstract

Objective: To determine the role of family history of epilepsy and consanguinity in Yemeni epileptic patients.

Materials and Methods: Prospective descriptive study including all epileptic patients attended Sana'a and Thamar universities hospitals in Yemen during the period from January 2014 to December 2015. Every case was subjected to full clinical examination, history of epilepsy, history of epilepsy in the family and consanguinity among parents. Information regarding family history of epilepsy and consanguinity was checked by two members of investigation team for assuring correct information. Special sheet was designed to collect demographic data, results of investigation and other possible risk factors. The data was entered into PC, and statistically analyzed using SPSS package (Univariate Analysis of Variance and N-Anove- test) was used to obtain P value and multiple regression model to obtain R square.

Results: The total numbers of epilepsy cases in this study were 300, of this (56.3%) were males and (43.7%) females. Most epilepsy cases (61.7%) were below 16 years of age. Positive family history was documented in 120 patients (40.0%) and positive parental consanguinity was 147 patients (49.0%). The onset of first crisis of epilepsy among <1-5 years age group patients who had positive family history of epilepsy and parental consanguinity, was high in comparison with those had no family history and no parental consanguinity, with significant P value 0.001 and 0.0001 respectively. Results of Univariate Analysis of Variance using N-Anove- test found significant differences between age and occurrence of epilepsy with P value reached to 0.000. Using multiple regression model, we found that there was independent correlation between epilepsy and each of family history, consanguinity of parents and birth asphyxia with (P value of 0.034, 0.017 and 0.008) respectively.

Conclusion: In our study we found that, the positive family history of epilepsy and consanguinity in epileptic patients increased the incidence of epilepsy mainly at early childhood.

Keywords: Family history of epilepsy; Consanguinity; Yemeni epileptic patients

Introduction

Epilepsy is the most common neurological disorder affects approximately 50 million people worldwide, most of them live in developing countries [1].

Several risk factors have been recognized for epilepsy including; head trauma, childhood diseases, family history of epilepsy, consanguinity, low socioeconomic level, birth trauma, history of febrile convulsions, neonatal jaundice, premature rupture of membranes and prematurity, are at higher risk of developing epilepsy than those who are not. Moreover, genetic link to epilepsy was established with the twin studies of Lennox [2].

Consanguinity of the parents might potentiate the tendency of familial aggregation of convulsive disorders in the community [3].

Consanguinity is a common marital habit practiced in many Arabic countries. In Yemen it was reported that 40% of marriage are consanguineous, with 85% of which are between first cousins [4]. This type of marriage is associated with many hereditary neurological diseases, one of them is epilepsy [5,6].

This study is the first to our knowledge in Yemen to evaluate the role of positive family history of epilepsy and consanguinity in Yemeni epileptic patients.

Materials and Methods

Prospective descriptive study of epileptic patients attended Sana'a and Thamar University hospital during the period from January 2014 to December 2015, were included in this study. Each patient was assessed by neurologist performing the necessary neurological examination such as Brain CT Scan or MRI and documented patient's history in details.

A separate questionnaire sheet was designed to document demographic data, the age of first seizure, age at the diagnosis, and other risk factors such as perinatal complications, infection of the central nervous system, mental retardation, neurological impairment,

history of febrile seizures, severe head trauma and cerebrovascular diseases.

In order to validate the information, the patient and his/her companion were both asked about the presence or absence of parental consanguinity and positive family history of epilepsy to ensure the accuracy of the information that was given, as it was the core of this study.

Positive family history of epilepsy defined as one or both couples of parents had epilepsy with apparent use of anti-epileptic drugs.

The consanguineous marriage was first and second degree in all of the cases.

Our cases mostly were generalized epilepsy, which is idiopathic epilepsy.

Idiopathic epilepsy was defined as epilepsy with no underlying structural brain lesion or other neurologic signs or symptoms, and presumed to be genetic.

The statistical analysis was done using Statistical Package for Social Sciences, PC version 5 (SPSS-PC) software. To examine the association of independent variables (parental consanguinity and family history of epilepsy) with epilepsy, study t-test was performed, and p value <0.05 was considered significant. Multivariate regression analysis was used to identify significant variables that could predict epilepsy for the whole group and for both genders. Parental consanguinity and family history of epilepsy were entered in the regression module. The associations between the study of parental consanguinity and positive family history of epilepsy with the risk of epilepsy were assessed.

Exclusion criteria

We excluded patients with secondary epilepsy, foreign patients and pseudo seizure.

Ethical consideration

Verbal consents were obtained from all the participants and caregivers of the epileptic children. To keep all the information obtained confidential with due respect to patients privacy.

Results

The total number of epilepsy cases in this study was 300, most cases 240 (80% were generalized type and 60 (20%) were other types. 169 (56.3%) were males and 131(43.7 %) were females.

Age distribution of the patients with epilepsy

Most cases of epilepsy 263 (87.7%) were young, below 26 years, while only 37 (12.3%) were above 26 years, as shown in Table 1.

History of first crisis of epilepsy

As seen in Table 2, 140 of the total cases gave history of the first attack of epilepsy within the age of five years or below, and 103 cases had history of first crisis of epilepsy at the age of (6-15 years). However only 57 cases experienced first crisis at the age of 16 years or above.

As we noticed at this table, most of the first epilepsy crisis occurred at age of five years or below, but for sorrow most of the patients sought medical help lately, due to culture believe about epilepsy as it is out of devil touch and so sought traditional healers.

Age in years	Epilepsy cases	Percent (%)	Cumulative Percent (%)
<1-5	75	25	25
6-15	110	36.7	61.7
16-25	78	26	87.7
26-35	26	8.7	96.3
36-70	11	3.6	100
Total	300	100	100

Table 1: Age distribution of the patients with epilepsy.

Age in years	History of 1st crisis of Epilepsy cases	Percent (%)	Cumulative Percent (%)
<1-5	140	46.7	46.7
6-15	103	34.3	81
16-25	46	15.3	96.3
26-35	9	3	99.3
36-70	2	0.7	100
Total	300	100	100

Table 2: History of first crisis of epilepsy among all age group.

Family history of epilepsy, consanguinity and epilepsy

Positive family history of epilepsy found in 120 (40.0%) of our cases and positive consanguinity found in 147 (49.0%) of our cases, as shown in Table 3.

Item	Sex		Total	Percent (%)
	Male	Female		
Family history				
Positive	72	48	120	40
Negative	97	83	180	60
Consanguinity				
Positive	97	50	147	49
Negative	78	75	153	51

Table 3: Family history of epilepsy and consanguinity among parents.

Age of onset of first crisis of epilepsy with family history of epilepsy and consanguinity

As shown in Table 4, The onset of first crisis of epilepsy among age of five years or less patients, in the presence of positive family history of epilepsy was higher than those with negative family history of epilepsy, as(54.2%, 41.7%) respectively. Similar findings noticed at patients experienced the first attack of epilepsy at age of five years or

less with positive consanguineous marriage than those had no consanguineous marriage, as (56.5% , 37.3%) respectively.

Item	1st crisis at <1-5 years	%	1st crisis at more than 5 years	%	Total	%	Cumulative %
Family history							
Positive	65	54.2	55	45.8	120	40	100
Negative	75	41.7	105	58.3	180	60	
Consanguinity							
Positive	83	56.5	64	43.5	147	49	100
Negative	57	37.3	96	62.7	153	51	

Table 4: Age of onset of first crisis of epilepsy with family history of epilepsy and consanguinity.

Epilepsy and risk factors

Table 5 shows risk factors found in epileptic patients; history of febrile convulsion, history of CNS infection and birth asphyxia, as found in (48, 30 and 28 patients) respectively. Parental consanguinity found in 147 patients, while family history of epilepsy among parents contributed of 120 patients.

Variable	Males	Females	Total
History of febrile convulsions			
Yes	30	18	48
No	139	113	252
History of CNS infection			
Yes	19	11	30
No	150	120	270
Birth Asphyxia			
Yes	16	12	28
No	153	119	272
Parental consanguinity			
Yes	91	56	147
No	72	81	153
Family history of epilepsy			
Yes	64	56	120
No	107	73	180
Other risk factors	30	17	47

Table 5: Risk factors among patients with epilepsy.

Other risk factors such as diabetes mellitus, smoking, jaundice, and congenital heart disease represented in 47 patients.

Using multiple regression test, we found family history, consanguinity and birth asphyxia were independent risk factors in epilepsy with p value of (0.034, 0.017 and 0.008) respectively (Table 6).

Variant	Correlations	P value
Family history	0.106	0.034
Consanguinity	0.124	0.017
Birth Asphyxia	0.251	0.008
Other risk factors	0.009	0.439
Family history	0.488	0
Consanguinity		
No risk factors	0.055	0.091

Table 6: Analysis of risk factors using multiple regression test.

The higher significant risk factor p value (0.0001) was in patients whom had family history of epilepsy concomitant with parental consanguinity.

Discussion

Our study is the first study in Yemen regarding the impacts of Yemeni epileptic patients child's originating from families with positive family history of epilepsy and consanguineous marriage.

We found that epilepsy was more frequent in males than female 169 (56.3%), versus 131 (43.7%). These differences were related to many factors, the most prominent one is the social stigma of epilepsy among females. Insufficient knowledge about epilepsy has been associated with a negative attitude and believes towards the patients and a tendency to stigmatize this condition. When a female is diagnosed with epilepsy, she should carry the loud of burden induced by the family and culture, so many families avoid bringing the female patient to hospital if she has epilepsy. This finding was reported by earlier studies [7-11].

Our study reveals that about 40.0% of the total patients categorized as coming from families of positive history of epilepsy, while 49 % of the total patients categorized as those coming from families of consanguineous marriage, which coincide with previous study from Yemen and Egypt [9,10].

However, these results are higher than results reported by [8,12,13], they reported (22.0%, 17.5% and 23.0%) respectively. This may be related to stigmatization which varies across different countries and cultures, also the questions regarding positive family history of epilepsy and parental consanguinity were obligatory as consanguineous marriage is common in Yemen, so in this study, we found high percentage of epilepsy with positive family history of epilepsy and parental consanguinity as (40.0% and 49.0%) respectively.

Regarding the onset of first crisis of epilepsy, it was high at the age of five years or less, for those categorized as coming from families with positive family history of epilepsy (54.2%) from the total patients had positive family history of epilepsy, in contrast to whom who had negative family history of epilepsy (41.7%) from the total patients had

negative family history of epilepsy, with P value (0.001). Similar findings found at those had positive parental consanguinity, as the onset of first crisis of epilepsy was high at the age of five years or less (56.5%) from the total patients with positive consanguineous marriage, in comparison to whom had negative consanguineous marriage (37.3%) from the total patients with negative consanguineous marriage, with P value (0.0001). These findings highlight that positive family history of epilepsy and consanguineous marriage are risk factors for epilepsy onset at early childhood.

Several other studies and reports have revealed a possible role of epilepsy positive family history and consanguinity marriage as main cause of family as indicated in the study of [14,15].

In similar manner a study in United Arab of Emirates found significant association between family history of epilepsy and the risk of developing epilepsy with most patients having a positive family history of epilepsy [16].

Various other numerous researches have showed possible genetic link and risk factor of epilepsy such as epilepsy syndrome on newly born child first year life while studies made in the middle east area where consanguineous marriage is traditionally considered common, supporting with their findings that consanguineous marriage in families with epilepsy carries a higher risk on newly born children to develop epilepsy [12,13,17].

The role of genetic factor in epilepsy was highlighted as discussion point of research since 1986 when Anderso et al. shed light to make it a point of discussion and research [18].

Further research's and studies which confirmed the inheritance genetic role in Juvenile Myoclonic Epilepsy (JME) as per the study made by [19-23].

Whilst we can still support our findings with other similar studies made in different part of the world and can put as much reference of these researchers however, even in the Arab world which has almost similarity of cultures where consanguinity marriage is very common as same way happening in Yemen all the studies also indicate the possible role played by inheritance genetic [14,16,24].

Summarizing the output of all above researches and studies leads us to one conclusion which is that, there is a strong link of genetic role of epilepsy inheritance in newly born children from consanguineous marriage of epileptic parents.

In other words the final results of these researches strongly support the consanguineous marriage within families who are positive with epilepsy has always carried a high risk of developing epilepsy in children [24,25].

Even though our study is considered the first study and research to knock this door however, it is unfortunate that we have limitation to further enhance the genetic portion of the research due to lack of genetic lab facilities in addition to existing political turmoil in Yemen.

This study also reveals that there has not been any relation with other epilepsy risk factors with presence of positive family history that may add more risk of developing epilepsy contrary to other group who carry negative family history and consanguinity which goes in line with study made in Iran by Asadi-Pooya [26].

In similar manner our findings are also supported with Similar studies made in Saudi Arabia, India ,Turkey support our findings as they are in line with our study, as these studies, regardless to other epilepsy risk factor, they have shed light of the high impact of positive consanguinity and family history of epilepsy to develop epilepsy [7,15,27-29].

This first research in this area in Yemen, reveals that the first epilepsy crisis on children of 1-5 age is higher within patients who are coming from families who carry positive history of epilepsy compared with those patients of negative family history of epilepsy and with even higher rate of epilepsy case for kids coming from parental consanguinity of both father and mother. This study goes in line with researches made on the genetic cause which indicates that most patients' epilepsy case reported before five years of age [24,25].

Accordingly, this study gives us an indication that the genetic factor may have been the main cause and a factor of epilepsy cases that occurred in children within the first five years of age and that the genetic factor may have played a big role in higher ratio and increased cases of epilepsy, however, due to lack of research facilities and related laboratories we are unable to confirm scientifically our above findings which needs a further separate study, possibly to get assistance by other advanced countries who do have such facilitates.

Conclusion

Consanguineous marriage and positive family history of epilepsy are independent risk factors for occurring of epilepsy in early childhood.

Recommendation

Avoid consanguinity marriage.

Perform medical check-up and consultation before marriage.

Medical education campaign for community awareness about high risk of consanguinity marriage.

Further study needed.

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