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RESEARCH ARTICLE

ASSESSMENT OF RISK FACTORS IN SCHIZOPHRENIA

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ABSTRACT

Schizophrenia is a mental illness which creates a great impact on the patient and his community. The examination of the various risk factors related to the disease is important in the determination of its aetiology. The present study aimed to examine the risk factors attributed to the development of schizophrenia. A case control study method was used comparing patients with schizophrenia with control subjects. The sample of cases and their controls were collected from Al-Zahrawy hospital in Mosul city. The sample collection was for the period from 1st January to 30th of June 2000. The sample of cases includes schizophrenia patients of both sexes at all ages attending the psychiatric clinic. The sample of cases included (104) patients with schizophrenia and the control subjects were (116). The disease was significantly seen among males in the age group of less than 25 years. In the age group of (25-44) years females were more significantly affected. No sex difference was seen in the sample of patients in general as a whole. Early age of onset (less than 25 years) was more significantly seen among the males. Late onset schizophrenia affects females more than the males. Family history among parents, brothers, sisters and relatives is significantly common in the sample of cases than their controls. Early age of onset is highly statistically significantly seen if there is positive family history of schizophrenia. Preclampsia and difficult labour are highly statistically associated and strongly related to the disease development. Cesarean section has no significant association to schizophrenia. Childhood and developmental abnormalities, CNS infections and accidents are highly statistically significantly and strongly associated with schizophrenia in the present research. Stressful life events are highly statistically and strongly related to schizophrenia. Being single or divorced are highly statistically significant and strongly related to schizophrenia. Being married is inversely related to the disease. Various risk factors were highly statistically and strongly related to schizophrenia in the present study. Minor factors were either not related to the disease development like cesarean section or act as a protective factor to it, like marriage. Further investigation of these factors is needed to evaluate their role in the disease development.

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INTRODUCTION

Schizophrenia is a clinical syndrome that imposes enormous personal and economic costs worldwide. It is a disease of the brain that manifests itself wit multiple signs and symptoms involving thought, perception, emotion, movement and behaviour, which is usually severe and long lasting (Gelder *et al*., 1996). The ($I.C.D_{10}$) defines schizophrenia as a group of mental disorders characterized by fundamental and characteristic distortion of thinking, perception and affect, clear consciousness and intellectual capacity are usually maintained, although certain cognitive deficits may evolve in the course of time. The disturbance involves the most basic functions which give the normal person a feeling of individuality, uniqueness and self direction (WHO, 1994).

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The major prevalence study of psychiatric illness in the United States surveyed 17803 adult persons between 1980-1984. The study found that the prevalence of schizophrenia was 1.4% among the general population (Keith *et al*., 1991). The WHO (1995) showed a general prevalence rate of schizophrenia of 158 per 100000 allover the world. The prevalence rate of those who are disabled due to the disease was 79 per 100000 population. Hafner and Reimann (1996) showed that the incidence rate of schizophrenia in Germany was 0.54 per 1000 population. Furthermore Wing and Frayers (1996) reported a similar rate of the disease in Camberwell (London), between 0.11-0.14 per 1000 population (Gelder *et al*., 1996).

Clinical features of Schizophrenia: The main clinical features are: Prominent persecutory ideas, with accompanying hallucination, gradual social withdrawal and impaired performance at work, and the odd ideas that other people can read their thoughts. These symptoms when present the disease

could be regarded as acute schizophrenia. The symptoms and signs are combined in many ways so that the clinical picture is variable. The most frequent clinical features of chronic schizophrenia are : social withdrawal, under-activity, lack of conversation, lack of interest, odd ideas and behaviours. Schizophrenia can be classified further to early onset (type I) and late onset (type II) disease. This classification is according to onset of occurrence of disease and presence or absence of positive symptoms (acute schizophrenia).The outcome of schizophrenia is worse than that of most other psychiatric disorders. Sudden onset, short episode, negative previous psychiatric history and good social relationships are considered to be good prognostic factors. The duration of the disease is variable according to the clinical features, the patients characteristics and the sociocultural conditions (Gelder *et al.,* 1996).

Risk Factors in Schizophrenia: Several risk factors have been blamed as predisposing factors to schizophrenia:

Age and Sex: Different studies showed that the schizophrenia is common among both sexes (Aldabagh,1974). A study in Saudi Arabia (1986) was conducted on 48 patients with acute schizophrenia revealed a significant increase in the cases of the disease among the males who are in the age group of less than 25 years. After the age of 25 years, the females were more significantly affected than the males (Al-Khani *et al*., 1986). Lewine (1981) have reported that the men have earlier age of onset than women. This association is evident especially among adolescents (Kamal1989). A retrospective study (1981-1983) was performed at the outpatient unit of the All India Institute of Medical Science. The study included 539 patients with schizophrenia examined regarding sex difference in age of onset of the disease in two years period. The study showed that the age of onset for males was earlier than that for females (Jayaswal *et al*., 1983). Poor premorbid adjustment with frequent and severe relapses are also more common among males than females Another study in Croatia which followed schizophrenic patients for the period from 1972 to 1984 revealed that the incidence rate in younger age groups was higher in males than females (Folnegovic *et al*., 1990). Murray *et al* (1992) have suggested that early age of onset of schizophrenia is a disorder of prenatal neurodevelopment in distinct from late onset forms and that abnormal neurodevelopment may be impart due to genetic defects. Lieberman and Sobel (1993) in their study noticed that the history of poor premorbid adjustment is found often in males and usually is associated with earlier age of onset and poor outcome.Sham *et al*. (1994) used a family study design with 195 patients with functional psychosis admitted to South London Hospital found a very early mean age at onset (21 years) among the male schizophrenics.

History of Schizophrenia in the Family: Schizophrenia is widely acknowledged to be a disease that runs in families (Marvin *et al*., 1995). Genetic factors are known to make an important contribution to the aetiology of schizophrenia (Gottesman and Schields, 1982). The results of family history data analysis suggested that both schizophrenia and mania are heritable diseases and that familial aggregation is probably stronger for mania (Gureje *et al*., 1994). McGlashan and Fenton (1991) in there study demonstrated that earlier onset of non paranoid schizophrenia (early onset schizophrenia) was associated with higher familial risk than later onset (paranoid schizophrenia). Kendler and Diehl (1995) concluded that schizophrenia aggregates strongly in families. In their study of schizophrenia patients, first degree relatives have 3% to 7% risk to develop schizophrenia. The risk is 5-10 times higher than that found in the relatives of controls. Children whose parents have had schizophrenia have at least 25% chance of developing the illness. Siblings of a person with schizophrenia show an expected risk of 8-14% (Gureje *et al*., 1994). A study was done in Royal Ottawa hospital in Canada (1996) showed that patients with no family history of schizophrenia have a high average age of onset of the disease. This effect was seen in both sexes. These results support the relationship between familial risk and early onset, but no interaction of gender and family history was found (Alda *et al*., 1996). All these findings suggest some type of genetic influence but the mode of transmission had not been found yet. However, environment along with genetic factors play an important role in schizophrenia development (O'Callaghan *et al*., 1992).

Obstetric and Perinatal Complications: History of obstetric complications have been shown to occur more among patients with schizophrenia (Peter and Buckley, 1998). McNeil and Kaij (1978) concluded that schizophrenic patients show a higher prevalence of obstetric complications than normal control subjects. They also reported that schizophrenic patients with obstetric complications tend to have first received psychiatric treatment at an earlier age. Turner (1986) found that the presence of brain damage due to birth injuries in schizophrenic patients are more frequently seen than in normal control subjects. The obstetric complications which have been implicated as possible environmental risk factor of schizophrenia were more common in the males than females (Pearlson *et al*., 1989). A case control study was done in the university of Edinburgh in 1996 revealed that babies born to mothers with preeclampsia are 9 times at risk to develop schizophrenia than babies with normal deliveries (Kendell *et al*., 1996). Jones *et al*. (1998) in North Finland demonstrated that babies with perinatal brain damage caused by various birth injuries and perinatal complications in newborn period along with other factors are 7 times more likely to develop schizophrenia in adulthood. Data from the same study showed that individuals who had suffered a viral CNS infection during childhood were almost five times more likely to develop schizophrenia than individuals in the comparison group.

Childhood and Developmental Abnormalities: The onset of schizophrenia can be preceded by certain developmental and behavioural abnormalities (Gelder *et al*., 1996). Kolven (1971) found that early onset group of schizophrenia included a delay in speech development and more evidence of cerebral dysfunction. Green (1987) studied 50 schizophrenic patients and suggested that indicators of the injuries of babies in the first trimester of pregnancy are found frequently among early onset schizophrenic patients.Watkins (1988) described delays in motor and language development in over than 70% of pre schizophrenia children. In addition, severe impairment in premorbid social adjustment in schizophrenic children have been reported (Asarnow and Ben-Meir, 1988). Walker and Lewine (1990) found that pre-schizophrenia children showed a typical emotional expressions and movements compared to their normal siblings. Hollis (1995) in London revealed a strong relationship between premorbid social impairment and language difficulties with early onset of schizophrenia. Cannon *et al*. (1997) in his retrospective study showed that pre-schizophrenic children have markedly poor overall social adjustment in childhood compared with non schizophrenic children.

Stressful Life Events: Recent clinical concept of schizophrenia have recognized the role of environmental stress as a major factor in the aetiology of schizophrenia. Jacobs and Myers (1976) conducted their study in Connecticut, USA, and found a significantly higher rate of stressful life events among schizophrenic patients. This was noticed especially in the first year following the event. A study was conducted in Baghdad (1978) on a sample of 100 schizophrenia patients in their first admission to Ibn-Rushd hospital. The study showed that 25% of the patients presented with psychological precipitating factors (Al-Maghazaji, 1978). In general, stressfulness of family life is considered to be less in the developing countries (Leff, 1981). Moller (1984) in West Germany showed that stressful life events were common in neurotic and schizophrenia patients. A case control study was carried out in Baghdad (1992) on 51 schizophrenic patients. The study found a significant life events prior to the onset of schizophrenia in comparison with their normal control subjects (Jaaz, 1992). It has been suggested further that stressful conditions might provoke acute schizophrenia in healthy persons (Marvin *et al*., 1995).

Marital Status: Various reports based on first hospital admissions have elicited increased rates of schizophrenia of unmarried than married patients. However, the disease lessens the chance of marriage and increases the chance of divorce (Marvin *et al*., 1998). Randolph (1994) in his study group of family management of schizophrenia patients found that 62% of the patients were never married, 24% were married, and 14% were separated or divorced. This result supports the importance of including family members in the community care of patients with schizophrenia. Cheadle *et al*. (1997) in Manchester identified that a significant proportion of schizophrenia men had never been married. Furthermore, one fourth of women with schizophrenia who were married were divorced by the time of interview.

The Aim of the Study: The present study aimed to examine the various risk factors among schizophrenia patients attending the psychiatric clinic in Al-Zahrawy teaching hospital for the period from the 1st January to 30th June 2000.

The following specific objectives are selected to carry out the general aim of our study:

- To distribute the patients with schizophrenia in the study sample according to age and sex.
- To compare the family history of schizophrenia in the sample of cases and their controls.
- To identify history of obstetric and perinatal complications among the mothers of patients with schizophrenia and their controls.
- To demonstrate history of childhood disease and developmental abnormalities in the sample of cases and their controls.
- To determine the presence of stressful life events in the sample of the present study.
- To classify the marital status of patients with schizophrenia and their controls.

MATERIALS AND METHODS

The present study is a case control study method aimed to examine the risk factors in schizophrenia patients attending Al-Zahrawy hospital in Mosul city. Al-Zahrawy hospital includes a consulting psychiatric clinic-receiving patients suffering from various psychiatric illnesses of both sexes. Schizophrenia patients attend Al-Zahrawy hospital seeking medical advice and management. Official permission was obtained for conducting the research. The sample of the present study includes patients with schizophrenia attending the psychiatric clinic of all ages and both sexes. The cases of schizophrenia in the sample must be diagnosed by a consulting psychiatrist and the duration of disease should not be less than two years. The schizophrenic symptoms when present should not dominate the clinical picture. Patients were excluded if schizophrenia-like symptoms occurred only transiently in association with alcohol or drug abuse. For every patient with schizophrenia one control subject is selected from those attending Al-Zahrawy hospital seeking management for disease other than schizophrenia. The process of control selection is based on paired control and individual matching for age and sex was done (Al-Kafajei, 1998). The period of the study lasted from 1st January-30th June 2000. The sample of cases in addition to their parents, relatives and their controls are interviewed by the investigator about the general purposes of the study. The investigator spent two years practicing as a registrar in the psychiatric ward in Ibn-Sina teaching hospital. He was engaged in the psychiatric service unit in the Nineva governorate for two years.

The investigator is also engaged in the WHO programmes of mental health in Mosul city. A questionnaire was prepared for the present research. The form of the questionnaire and its variables were seen by specialized psychiatrists. The variables in the form were modified according to their opinions. It included the following information: Age, sex, history of present illness, family history of the disease in the parents, brothers, sisters or relatives, history of obstetric or perinatal complications, history of childhood and developmental abnormalities of patients, history of stressful life events prior to the onset of illness and marital status. The history of the present illness including time of onset of the disease. The family history of the disease is recorded if schizophrenia is present in any one of the parents, brothers, sisters or relatives. The history of childhood and developmental abnormalities includes poor social adjustment, delayed walking, speech difficulties and poor premorbid status. History of stressful life events is recorded when there is a major event happened during 6 months before the onset of the illness. A questionnaire is filled for every one in the sample of the patients and their controls except for the variables related to history of the present illness. The analysis of data was done by the investigator using χ^2 and Z-test (one-proportion), for the significance between groups. The various risk factors were compared between the cases and their controls. The odd's ratio and its 95% confidence interval were calculated for identifying the magnitude of the risk factors in the disease development (Al-Kafajei, 1998).

RESULTS

The sample of the present study comprised (104) cases of schizophrenia and (116) of their controls during the study period. Table-1 revealed the distribution of cases of schizophrenia according to age and sex. It is seen that the disease is significantly noticed in the males less than 25 years of age, than females in the same age group, ($p < 0.05$). In the age group of (25-44) years the disease significantly affects the females more than the males ($p < 0.05$).

Table 1. Distribution of patients with schizophrenia according to age and sex

Age in years	Sex		Total Number (%)	p - value
	Male %	Female %		
< 25	71.4	28.6	21 (20.2)	< 0.05
25-44	37.5	62.5	56(53.8)	< 0.05
45-64	43.5	56.5	23(22.1)	N.S
65 +	50.0	50.0	4(3.9)	N.S
Total	46.2	53.8	104(100%)	N.S.

Table 2. Distribution of patients with schizophrenia according to age of onset of disease and sex

Age of onset in years	Sex		Total Number (%)	p - value
	Male %	Female %		
< 25	71.4	28.6	42 (40.4)	< 0.05
25-44	28.1	71.9	57 (54.8)	< 0.05
45-64	40.0	60.0	5 (4.8)	N.S
65 +	0.0	0.0	0 (0.0)	-
Total	46.2	53.8	104 (100%)	N.S.

Table 3. The sample of cases and their controls distributed according to family history of schizophrenia

Family history of schizophrenia	Patients		Controls		p - value	O.R.	95% CI
	No.	%	No.	%			
Parents	6	5.8	0	0.0	< 0.05	-	-
Siblings	1	0.9	0	0.0	N.S.	-	-
Brothers and Sisters	16	15.4	3	2.6	< 0.001	6.9	2.1-23.2
Relatives	24	23.1	5	4.3	< 0.001	6.7	2.6-17.3
No history	57	54.8	108	93.1	< 0.001	0.1	0.0-0.2
Total	104	100	116	100	-	-	-

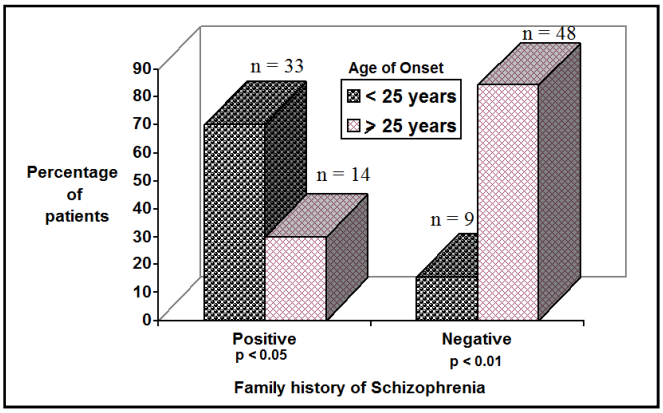

Figure 1. Family history of schizophrenia among the sample of cases according to age of onset

Table 4. Obstetric and perinatal complications among mothers in the sample of cases and their controls

Type of complications	Patients		Controls		p - value	O.R.	95% CI
	No.	%	No.	%			
Preeclampsia	11	10.6	1	0.9	< 0.001	13.6	1.4-135.2
Difficult labour	7	6.7	4	3.4	< 0.001	2.0	0.4-10.9
Infection during pregnancy*	2	1.9	0	0.0	N.S	-	-
Cesarean section	1	0.9	1	0.9	N.S	1.1	0.8-1.5
Negative history	83	79.8	110	94.8	< 0.001	0.1	0.0-0.4
Total	104	100	116	100	-	-	-

* Two cases of influenza were reported during pregnancy.

However, no significant difference is seen between the male and female groups in the whole sample of cases in general. Age of onset of disease among both sexes is noticed in Table 2. The table shows a significant early age of onset among males in the age of less than 25 years. In the present study the family history of schizophrenia is more common among the sample of cases than the controls. Table 3 elicits that schizophrenia in the parents is significantly seen among the sample of cases. No one of the parents of the controls has this disease.

There is a high statistically significant and a strong relationship of family history in the brothers and sisters and in the relatives in the patients of schizophrenia ($p < 0.001$, OR = 6.9 and 6.7 respectively. Negative family history of the disease is highly statistically significantly seen in the control subjects. Figure 1 demonstrates that positive family history of schizophrenia is significantly associated with early onset of the disease, (Those patients who are less than 25 years of age). Table 4 reveals types of obstetric and perinatal complications developed for mothers in the study sample.

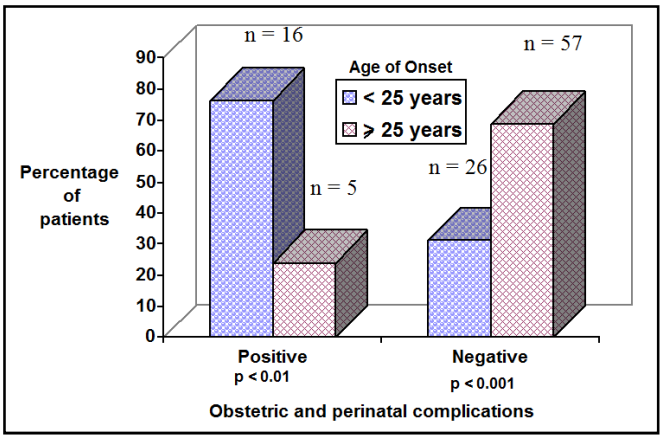

Figure 2. History of obstetric and perinatal complications among mothers of patients according to age of onset

Table 5. History of childhood disease and developmental abnormalities among patients with schizophrenia.

Type of abnormalities	Patients		Controls		p-value	OR	95% CI
	No.	%	No.	%			
Development and behavioural	18	17.3	2	1.7	<0.001	11.9	3.3-43.3
CNS infections	8	7.7	0	0	<0.01	-	-
Accidents and head injuries	4	3.8	0	0	N.S.	-	-
Epilepsy	3	2.9	1	0.9	N.S.	3.4	1.6-7.1
Mental retardation	2	1.9	0	0	N.S.	-	-
Other mental and neurological disorders	4	3.9	1	0.9	N.S.	4.6	0.2-92.9
No history	65	62.5	112	96.5	<0.001	0.1	0.0-0.2
Total	104	100	116	100	-	-	-

Table 6. The presence of stressful life events among patients with schizophrenia and their controls

Stressful life of events	Patients		Controls		p - value	O.R.	95% CI
	No.	%	No.	%			
Severe psychological trauma	31	29.8	2	1.7	< 0.001	24.2	10.8-54.2
Family problems	28	26.9	10	8.7	< 0.001	3.9	1.8-8.6
Problems in the study and work	16	15.4	5	4.3	< 0.025	4.0	1.4-11.5
After labour	5	4.8	1	0.9	N.S.	5.8	0.5-66.8
Negative history	24	23.1	98	84.4	< 0.001	0.1	0.1-0.2
Total	104	100	116	100	-	-	

Table 7. The marital status of the patients with schizophrenia and their controls

Marital Status	Patients		Controls		p - value	O.R.	95% CI
	No.	%	No.	%			
Single	59	56.7	25	21.6	< 0.001	4.8	2.7-8.6
Married	32	30.8	81	69.8	< 0.001	0.2	0.1-0.4
Divorced	11	10.6	5	4.3	< 0.001	2.6	0.8-9.0
Widow	2	1.9	5	4.3	N.S.	0.4	0.1-3.3
Total	104	100	116	100	-	-	-

The association of preeclampsia among the mothers of schizophrenia patients and the disease development is highly statistically significant, association is also strongly related (OR = 13.6). Difficult labours has a highly statistically significant and a strong association with the disease ($p < 0.001$, OR = 2.0). No significant association is seen between cesarean section with schizophrenia development in the study sample. Negative history of obstetric complications for mothers of the control subjects is highly statistically significantly seen. Figure-2 illustrates the association of the history of obstetric and perinatal complications with onset of the disease in the sample of cases. It is shown that positive family history of obstetric and perinatal complications among the mothers of patients is highly statistically significantly associated with early onset of schizophrenia. Table 5 elicits that 17% of the sample of cases in our study were complaining of developmental and behaviour abnormalities during their childhood period. It is also seen that 8% of the patients had CNS infections and 4% had accidents and head injuries.

The present study found that severe psychological trauma and family problems are highly statistically significantly associated to schizophrenia development. Their association to disease development in the sample of cases is strongly related too (OR = 24.2 and 3.4 respectively), (See Table 6). Table 7 shows the marital status of patients and their controls. Being single is highly statistically significantly related to schizophrenia development among the cases. The relationship is also strongly associated (OR = 4.8). Marriage is significantly seen among the controls than the patients and it acts as a protective factor in this study ($p < 0.001$, OR = 0.2). Being divorced is highly statistically significantly associated with the disease development ($p < 0.001$, OR = 2.6).

DISCUSSION

The present study included the examination of various risk factors which have important role in the development of schizophrenia. A case control study method was used for

fulfilling the comparison of cases of the disease and control subjects. Schizophrenia can affect both sexes at any age group especially young adults. This mental disease is characterized by a defect in thinking perception and affect. These symptoms have an impact on the patients family and society. The disease appears during the active period of patient life. The present study found that half of the sample are in the age group of (25-44) years. Kolakowska *et al*. (1995) noticed that 35% of his sample of schizophrenia or schizoaffective disorder was under the age of 30 years and 40% between (30-39) years. Harvey in his study in London (1996) of schizophrenia cases identified 56% of the patients being young adults. Young adults are more prone to the effect of the disease because of different social and cultural changes. Young people in the active group undertake various family responsibilities (Gelder *et al*., 1996). The onset of disease may occur in the early age of life or it may be late. This association is related to the sex of the patients. Males are having early age of onset of schizophrenia than females. Late onset schizophrenia is more common among females (Gelder *et al*., 1996). The present study demonstrated that the disease starts early in the age group of less than 25 years more significantly among males than females. The age of onset of schizophrenia in communities of the developing countries are more earlier in males than females (كمال ، 1989). He reported that the possible cause for this is the increase responsibilities of the males for their families. He added that another probable cause is underreporting of the disease among the females in the developing countries because of sociocultural considerations.

Castle and Murray (1991) suggested that the increased incidence of early onset schizophrenia among the males is because of neurodevelopmental changes, while the affective disorders are more common in the females in the later onset schizophrenia. Family history of schizophrenia is highly statistically significantly and strongly related to the sample of cases in the present research especially brothers and relatives. Several studies have reported similar results. Weissman (1996) revealed that schizophrenia is more common among first degree relatives of schizophrenics compared with relatives of their controls. Parnas (1993) and Kendell *et al*. (1996) in their studies of first degree relatives of patients with schizophrenia reported the same association. These family studies provided a clear evidence of familial aetiology but do not distinguish between the effects of genetic factors and those factors due to environment. Schizophrenia starts early in life more common among those who have positive family history of the disease in the parents, brothers or any of their relatives. Kendler and Maclean (1990) in a Swedish family study found an inverse relationship between risk of family history of schizophrenia and age of onset of the disease. Conflict family situations because of the presence of schizophrenia patients probably enhance environmental factors to act with genetics to develop schizophrenia (Gelder *et al*., 1996). Birth injuries which lead to brain damage are associated with increased incidence of schizophrenia compared with normal subjects.

Buka *et al*. (1993) in his prospective study suggested that there is a strong association of particular obstetric complications with schizophrenia. Geddes and Lawrie (1995) showed that schizophrenic patients had a greater number of obstetric and delivery complications than those who are not. This study found a high statistically significant and a strong association between preeclampsia and difficult labour with the disease development in the sample. Fetal hypoxia may be the commonest mechanism underlying these associations. In addition to neuronal damage (Buka *et al*., 1993). Peter and Buckley (1998) reported that infections, damages and accidents to CNS of babies in the perinatal periods may be followed by schizophrenia development. Foster (1987) noticed that early onset schizophrenia is associated with a more compromised CNS damage. Cesarean section was found to have no significant association with schizophrenia development in the present study. Childhood and developmental abnormalities including premorbid defects are significantly common in the sample of cases. Rantakallio *et al* (1997) showed that individuals who had suffered CNS infection during childhood period were more likely to develop schizophrenia than individuals in the comparison group. In the same study, patients who were schizophrenic were also more likely to have history of childhood epilepsy and perinatal brain damage. Schizophrenia is strongly related to various stressful life events. Brown and Birely (1970) found that there were a significant association between stressful life events and schizophrenia development.

Jacob and Myers (1976) and Al-Khani *et al*. (1986) identified that schizophrenia has a high incidence of stressful life events prior to their disease occurrence. The present study noticed a high statistically significant and a strong association between psychological traumas and family problems with schizophrenia development. The possible explanation of the strong relationship between family problems and schizophrenia development may be due to the fact that members of the family spouse or parents may fail to cope with every day duties resulting in failure to maintain stable family life. Their interaction is inadequate leading to conflicts between members of the family (Kamal, 1989). Al-Chaleby (1986) confirms that the family problems as a major stress must have its root in the family structure. Robertson (1974) and Alkhani *et al.* (1986) found that single subjects of both sexes are at high risk to develop schizophrenia than the married subjects. The present study showed a statistically significant and a strong association between unmarried subjects and schizophrenia development. A possible explanation is that most schizophrenia patients are unable to carry out the marriage responsibilities. Marriage acts as a strong barrier against different mental illness (Al-Khani *et al*., 1986). Being divorced is significantly associated with the disease in the present study. Harvey (1996) found that (63%) of schizophrenia patients were never married, (14%) married and (23%) divorced or widow.

Conclusion

The present study examined the various risk factors attributed to the development of schizophrenia.

- The commonest age group of the disease in general is between (25-44) years. Schizophrenia affects the males in the age group less than 25 years more than the females in the same age group, while the disease is more significant among the females in the age group of (25-44) years
- The age of onset of the disease was earlier among the males. Late onset schizophrenia is more common in females.
- Family history of schizophrenia is common among the parents, brothers and sisters and the relatives of schizophrenic patients. The disease starts earlier among those having a positive family history in general.

- Preeclampsia is highly statistically significantly and strongly related to schizophrenia. Cesarean section has no significant relation to the disease.
- Obstetric and perinatal complications are highly statistically and significantly and strongly related to early onset of the disease in general.
- Developmental and behavioural abnormalities, CNS infections and accidents are frequently found among the patients in the present study.
- Stressful live events especially psychological traumas, family problems and divorce and problems in the study and work are highly significantly and strongly related to the disease.
- Half of the patients in the present research were single.

Recommendations

- The mental health system is required to intervene on the family level in order to provide support and to reduce the stressful influences that may contribute to onset or relapse of the illness.
- Non governmental organization (Iraqi Women Union) can contribute in reduction the stressful influences, which played a role in the development of schizophrenia.
- This study recommends further examinations of the risk factors for the determination of specific association to schizophrenia.
- Periodical epidemiological studies are needed to show the size of the problem of the disease in our community.

Abbreviations

%	Percentage
CNS	Central Nervous System
$I.C.D_{10}$	International Classification of Disease tenth revision
N.S	Non-significant
No	Number
OR	Odd's ratio
p	Probability
WHO	World Health Organization
$\square^2$	Chi-squared
□□□□C.I.	95% Confidence Interval

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