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Research Article

Clinical Symptoms and Risk Factors Associated with Schizophrenic Patients in Yemen

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Abstract

Intussusception is defined as the telescoping of one segment of intestines into another causing intestinal obstruction. This condition although common in children is considered a rare condition in adults and is usually present secondary to a pathological lead point like a neoplasm in adults. It usually presents with non-specific complaints like abdominal pain and as such peri umbilical ecchymosis (Cullen's sign) has not been seen as a presenting symptom of intussusception. Here we present a rare case of acute abdominal pain with contrast imaging of abdomen revealing ileo ileal intussusception. The patient had periumblical ecchymosis (Cullen s sign) on abdominal examination.

Keywords: reverden suture; caesarean section; endometritis

Introduction

Schizophrenia is a [1] mental disorder illustrated by persistent or recurrent [2] psychotic episodes. The main symptoms include hallucinations (usually hearing voices), disorganized thinking and delusions [3]. Additional symptoms comprise decreased emotional expression, social withdrawal, and apathy [2]. Symptoms usually develop progressively, begin during youth, and in many cases never resolve [3,4]. Present is no objective diagnostic tests. Diagnosis is established on observed behavior, a record that comprises the person's reported experiences, and reports of others recognizable with the person [3]. For a diagnosis of schizophrenia, symptoms and functional impairment must have been present for six months (DSM-5) or one month (ICD-11) [3]. Numerous schizophrenia patients suffer from other mental disorders, particularly anxiety disorders, substance use disorders, depressive disorders, and obsessive-compulsive disorder [3]. Approximately 0.3% to 0.7% of world population are diagnosed with schizophrenia throughout their lifetime [5]. There were an estimated 1.1 million new cases during 2017, and in 2022 there were a total of 24 million cases internationally [6]. Males are most often affected than females and males on average have an earlier onset [6]. The reasons of schizophrenia comprise genetic and environmental factors [2]. Genetic factors comprise a diversity of common and uncommon genetic alternatives [7]. Potential environmental factors comprise urban upbringing, cannabis use during adolescence, infections, older ages of the person's mother or father, and poor nutrition of mother during pregnancy [2,8]. About half of people with schizophrenia will experience significant long-term improvement with no further relapses, and a small proportion will fully recover [3,9]. The other half will be impaired for life [10]. In severe cases patients can be hospitalized [10]. Social difficulties such as homelessness, long-term unemployment, poverty, exploitation, and victimization are frequently associated with schizophrenia [11, 12]. Contrasted to the general population, patients of schizophrenia have an elevated suicide rate roughly equal to 5% overall the patients, and greater physical health problems [13, 14] which results in a reduced life expectancy of 20 years [15] to 28 years [16]. An estimated of 17,000 deaths were linked to schizophrenia in 2015 worldwide [17].

Since early 2011, Yemen has been experiencing political instability and war. The population of Yemen in general and Sana'a in particular suffer from an insecure pace of life and may suffer from mental and physical stress that can affect their mental health. It is clear that there are limited studies in Yemen that study and discuss infectious diseases [18-30], immune diseases, antimicrobial resistance, etc. [31-33], but unfortunately we did not find and there are no studies on mental health in Yemen in general and schizophrenia in particular. Thus, the aim of this study was to study and identify the clinical symptoms, associated mental disorders, and associated factors among a

selected sample of schizophrenia patients in Al-Amal Hospital for Psychiatric Diseases in Sana'a. The specific objectives were to compare exposure to suspected risk factors for schizophrenia in a cohort of schizophrenia patients with those randomly selected from the community.

Materials And Methods

Study sample

The researchers approached inpatient in Al-Amal Hospital for Psychiatric Diseases with a diagnosis of schizophrenia. Patients from this list were then randomly selected using the card-shuffling technique. Patients were included in the study if a review of their records confirmed a diagnosis of schizophrenia according to DSM IV criteria, they were ≥18 years old, and had attended the clinics between the period January 2021 and December 2021. Controls were from general population by selected randomly from the list of census by simple random selection from Sana'a governorate. The comparator (control) was selected by simple random sampling in order to make statistical conclusions about the population. It also helps ensure high internal validity: randomization is the best way to minimize the influence of potentially confounding variables. In this way, the basic requirements were prepared for this, as a complete list of each member of the population was obtained in Sana'a Governorate. The random selection was done by computer, after which each of the 110 selected residents was contacted or reached. Data was collected from them by telephone or access to them.

Data analysis: Descriptive statistics were computed as mean and frequencies (count and percentages). The two-tailed paired *t*-test was used to compare continuous characteristics (age) between the groups. Comparisons between schizophrenia cases and healthy control (outcome variable) with respect to patient characteristics (age, gender, highest level of education, employment status, poor adherence, income, substance abuse, etc were examined by the use of contingency tables (chi-squared test with Yates correction and Fisher's exact test, ORs). All analyses were calculated by the Epi-Info version 7 (CDC, USA).

Ethical Consideration: Ethical approval No:1699 dated January 1, 2021 was taken from the Medical Ethics and Research Committee of the Faculty of Medicine and Health Sciences, Sana'a University. The trial was according to the ethical guidelines of the review committee.

Results

A total of 110 patients with a diagnosis of schizophrenia were included in the study. Most (95.5%, 105) of the patients were males, while female only counted 4.9%, 5. The mean age of patients was 33.7±9.6 years, min age was 20 years, and max. 75 years. Most of the patients were in age groups 20 – 29 years (40%) and 30-39 years (43.6%). Regarding the control group, males counted 73.6% and females was 26.4%. The mean age of control was 28.6±7.5 years, min age was 18 years, and max. 48 years (Table 1).

Characters	Cases n=110		Control n=110	
	Number	percentage	Number	percentage
Gender				
Female	5	4.9	29	26.4
Male	105	95.5	81	73.6
Age groups				
20 – 29 years	44	40	78	70.9
30-39 years	48	43.6	18	16.4
40 – 49 years	6	5.5	14	12.7
≥ 50 years	12	10.9	0	0
Total	**110**	**100**	**110**	**100**
Mean age	33.7 years		28.6 years	
SD	9.6 years		7.5 years	
Median	33 years		27 years	
Mode	35 years		28ears	
Min	20 years		18 years	
Max	75 years		48 years	

Table 1: Age and Gender Distribution of schizophrenic patients and the control in Sana'a City, Yemen

The signs and symptoms and aassociated mental and other disorders among schizophrenic patients are illustrated in Table 2. Regarding, delusions 98.2% suffering from delusions , and most of the patients were suffering from high delusions (80%), while moderate delusions occurred in 14.5% and slight was 3.6%. Regarding, disorganize thinks occurred in all patients (100%), most of the patients were suffering from high rate equal to 64.5%, while moderate occurred in 26.4% and slight was only 5.5%. Regarding, hallucination, 98.2% were suffered from hallucination and more than half of the patients were suffering from high rate e(58.2%), while moderate occurred in 31.8% and slight was only 8.2%. Extremely disorganized was occurred in 92.7% of the patients, 36.4% showed high level, 45.5% showed moderate level while 14.5% showed slight level. Negative symptoms was occurred in 90.9% of the patients, 36.4% showed high level, 30.9% showed moderate level while 23.6% showed slight level. Cognitive symptoms were occurred in 50% of the patients, and most of them with slight level Regarding associated mental disorders, 12.7% of the patients had substance use disorders, 38.2% had depressive disorders, 11.8% had anxiety disorders, and 6.4% had obsessive–compulsive disorder. Regarding chronic disorders, 11.8% of the schizophrenic patients suffered from hypertension and 10.9% diabetics (Table 2).

Characters	Cases n=110	
	Number	percentage
Delusions	**108**	**98.2**
Slight	4	3.6
Moderate	16	14.5
High	88	80
Disorganize thinks	**110**	**100**
Slight	6	5.5
Moderate	29	26.4
High	71	64.5
Hallucination	**108**	**98.2**
Slight	9	8.2
Moderate	35	31.8
High	64	58.2
Extremely disorganized	**102**	**92.7**
Slight	16	14.5
Moderate	50	45.5
High	38	34.5
Negative symptoms	**100**	**90.9**
Slight	26	23.6
Moderate	34	30.9
High	40	36.4
Cognitive symptoms	55	50
Slight	47	42.7
Moderate	6	5.5
High	2	1.8
Associated mental disorders		
substance use disorders	14	12.7
depressive disorders	42	38.2
anxiety disorders	13	11.8
obsessive–compulsive disorder	7	6.4
Hypertension	13	11.8
Diabetics	12	10.9

Table 2: The signs and symptoms and aassociated mental and other disorders among schizophrenic patients in Sana'a City, Yemen

Regarding associated risk factors of schizophrenia, there was significant association with low income in which odds ratio was 7.1, 95% CI=3.5-14.3 and p <0.001, loss work (OR=57, 95% CI=24.8 - 133 and p <0.001), smoking (OR=5.9, 95% CI=3.1 – 11.1 and p <0.001), Khat chewing (OR=12.4, 95% CI= 6.3 – 24.7 and p <0.001), birth complications (OR=7.2, 95% CI=1. 6 – 32.8 and p <0.001), 1-6 Apgar scores (OR=1.8, 95% CI=1.1 – 3.3 and p=0.04), older paternal age (OR=3.2, 95% CI=1.5-6.8, and p <0.001), the spring birth (OR=2.2, 95% CI=1.2-4.2, and p =0.01), and winter birth (OR=1.9, 95% CI=1.1-3.4, and p =0.02), parental socioeconomic status (OR=7.1, 95% CI=3.5-14.3, and p <0.001), childhood trauma (OR=1.9, 95% CI=1.1-3.4, and p=0.02), cannabis (marijuana) use in adolescence (OR=7.4, 95% CI=1.0-61, and p =0.03), family history of schizophrenia(OR=12.1, 95% CI=1.5-95, and p =0.002), hypertension(OR=4.7, 95% CI=1.3-17.2, and p =0.009), and diabetics (OR=6.6, 95% CI=1.4-30.2, and p =0.005) (Table 3).

Characters	Cases n= 110		Control n= 110		OR	95% CI	X^2	P
	No	%	No	%				
Marital status								
Married	59	53.6	52	47.3	1.2	0.75-2.1	0.89	0.34
Single	51	46.4	58	52.7	0.77	0.45-1.3	0.89	0.34
Residency								
Rural	49	44.5	51	46.4	0.92	0.54-1.58	0.073	0.78
Urban	61	55.5	59	53.6	1.1	0.63-1.8	0.073	0.78
Economic status								
Housing								
Own	88	80	51	46.4	4.6	2.5-8.4	26.7	<0.001
Rent	22	20	59	53.6	0.21	0.11-0.3	26.7	<0.001
Income								
High	10	9.1	16	14.5	0.58	0.25-1.3	1.5	0.21
Moderate	2	1.8	38	41.8	0.035	0.008-0.15	39	<0.001
Low	98	89.1	56	50.9	7.1	3.5-14.3	33.8	<0.001
Loss of work								
Yes	92	83.6	10	9.1	57	24.8-133	126	<0.001
No	16	14.6	100	90.9				
Smoking								
Yes	59	53.6	18	16.4	5.9	3.1-11.1	33.5	<0.001
No	51	46.4	92	83.6				
Khat chewing								
Yes	96	87.3	39	35.5	12.4	6.3-24.7	62	<0.001
No	14	12.7	71	64.5				
Birth complications								
Yes	13		2		7.2	1.6-32.8	8.6	0.003
No	97		108					
Birth weight								
Normal	71		67		1.2	0.67-2	0.31	0.57
Low	39		43		0.85	0.4-1.4	0.31	0.57
Apgar scores								
1-6	41		27		1.8	1.1-3.3	4.2	0.04
7-10	69		83		0.54	0.3-0.9	4.2	0.04
paternal age								
older	29		11		3.2	1.5-6.8	9.9	<0.001
Younger	81		99		0.31	0.14-0.6	9.9	<0.001
Maternal smoking during pregnancy								
Yes	38		27		1.6	0.9-2.9	2.6	0.1
No	72		83					
season of birth								
The Spring	35		19		2.2	1.2-4.2	6.3	0.01
The Summer	21		39		0.42	0.22-0.79	7.4	0.006
The autumn	18		29		0.54	0.28-1.05	3.3	0.07
The Winter	36		23		1.9	1.1-3.4	4.8	0.02
parental socioeconomic status								
High	10	9.1	16	14.5	0.58	0.25-1.3	1.5	0.21
Moderate	2	1.8	38	41.8	0.035	0.008-0.15	39	<0.001
Low	98	89.1	56	50.9	7.1	3.5-14.3	33.8	<0.001
childhood trauma								
Yes	41		26		1.9	1.1-3.4	4.8	0.02
No	69		84					
cannabis (marijuana) use in adolescence								
Yes	7		1		7.4	1.0-61	4.6	0.03
No	103		109					
Family history of schizophrenia								
Yes	11		1		12.1	1.5-95	8.8	0.002
No	99		109					
Hypertension	13	11.8	3		4.7	1.3-17.2	6.7	0.009
Diabetics	12	10.9	2		6.6	1.4-30.2	7.6	0.005

Table 3: Associated risk factors of schizophrenic patients comparing to healthy control in Sana'a City, Yemen

The Apgar score is based on a total score of 1 to 10. The higher the score, the better the baby is doing after birth. A score of 7, 8, or 9 is normal and is a sign that the newborn is in good health

Discussion

To our knowledge, this is the first Yemeni case-control study to investigate risk factors for schizophrenia. In the current study, most patients with schizophrenia (95.5%, 105) were male, while only 4.9% were female, 5 (Table 1), this finding is similar to that reported globally in which males are affected more often and on average have early onset [6]. In the current study, the mean age of patients with schizophrenia was 33.7 ± 9.6 years, the minimum age was 20 years, and the maximum. 75 years, these values indicated that disease onset in our patients occurred in the early 20s and early 30s, and late or very early disease onset (before the 20s) is rare in Yemen. These results are consistent with those reported elsewhere in which disease onset typically occurs between the late teens and early 30s, with peak incidence in males in the early to mid 20s, and in females in the late 20s [3,4,36]. Onset before the age of 17 is known as early onset, and before the age of 13, as it can sometimes occur, is known as childhood schizophrenia or very early onset [3, 37]. Onset can occur between the ages of 40 and 60,

known as late-onset schizophrenia [38]. Onset after the age of 60, which may be difficult to distinguish as schizophrenia, is known as very late-onset schizophrenia-like psychosis [38]. Late onset has revealed a higher proportion of females to be affected; they have less severe symptoms and need lower doses of antipsychotics [38]. The tendency to appear earlier in males is observed to be counterbalanced by the postmenopausal increase in growth in females. Estrogens produced before menopause have a moderating effect on dopamine receptors but their protection can be overridden by genetic overload [39]. Also, in Yemen and throughout the world, there is a significant increase in the number of elderly people with schizophrenia compared to what the case 30 years ago [40]. Schizophrenia is a mental disorder described by significant changes in cognition, thoughts, mood, and behavior [41]. Symptoms are expressed in terms of positive, negative, and cognitive symptoms [4,42]. The positive symptoms of schizophrenia are the same as for any psychosis and are occasionally referred to as psychotic symptoms. These may be existing in any of the another types of psychosis, and are frequently transient making early diagnosis of schizophrenia problematic. First-time psychosis in a person who is later diagnosed with schizophrenia is referred to as first-episode psychosis (FEP) [43,44].

In the current study, with regard to positive symptoms, 98.2% of patients had delusions, 100% had disordered think, 98.2% had hallucinations, and 92.7% had extremely disorganized; all positive symptoms were at high levels (Table 2). Positive symptoms are those that are not felt normally, but appear in people during a psychotic episode in schizophrenia. They include delusions, hallucinations, and disorganized thoughts and speech, which are commonly considered manifestations of psychosis [43]. In the current study, 98.2% of our patients experienced hallucinations, and this score is higher than that reported by Montagnese *et al.* [45], in which hallucinations occur at some point in life in 80% of people with schizophrenia [45] and most often involve the sense of hearing but may occasionally involve any of the other senses of taste, sight, smell, and touch [46]. The frequency of hallucinations involving multiple senses is twice that of those involving only one [45]. It is also typically associated with the content of the imaginary subject [47].

In the current study, 98.2% of the patients had delusions. Delusions are strange or oppressive in nature. Distortions of subjective experience such as feeling as if one's thoughts or feelings do not really belong to oneself, to believing that thoughts are being inserted into one's mind, sometimes called negative phenomena, are also common [48]. Thought disorders can include impaired thinking and disorganized speech [4]. Positive symptoms generally respond well to medication, [2] and decrease over the course of the disease, possibly related to age-related declines in dopamine activity [3].

In the current study, 90.9% of the patients developed negative symptoms, 36.4% showed a high level, 30.9% showed a moderate level while 23.6% showed a slight level (Table 2); Negative symptoms are deficiencies in normal emotional responses, or in other thought processes. The five known areas of negative symptoms are: poor affectivity - showing flat expressions or little emotion; alogia - poverty of speech. anhedonia - inability to feel pleasure; asociality - lack of desire to form relationships, and avolition - lack of motivation and apathy [49,50]. Anhedonia and avolition are seen as motivational deficits ensuing from damaged reward processing [51]. Reward is the main driver of motivation and is mostly mediated by dopamine. It has been elected that negative symptoms are multidimensional and have been categorized into two sub-domains of apathy or lack of motivation and diminished expression [49,52]. Apathy comprises, anhedonia, avolition and social withdrawal. Diminutive expression includes the express effect, and alogia [53]. Sometimes poor expression is treated as verbal and non-verbal [54]. Apathy accounts for about 50 percent of the negative symptoms that are often found and affect later functional outcomes and quality of life. Apathy is associated with impaired cognitive processing affecting memory and planning including goal-directed behavior [55]. The two subdomains have suggested a need for separate treatment approaches [56]. Lack of distress associated with reduced experience of depression and anxiety is another noted negative symptom [57]. Often a distinction is made between those negative symptoms that are inherent in schizophrenia, which are called primary; and those that result from positive symptoms, from side effects of antipsychotics, substance use disorder, and social deprivation are termed secondary negative symptoms [58]. Negative symptoms are less responsive to medication and more difficult to treat [56]. However, if secondary negative symptoms are properly assessed, they are treatable [52].

In the current study, cognitive symptoms were occurred in 50% of the patients, and most of them with slight level. This rate is lower than report worldwide which it estimated to be 70% of those with schizophrenia have cognitive deficits, and these are most pronounced in early onset and late-onset illness [38]. These are often evident long before the onset of illness in the prodromal stage, and may be present in early adolescence, or childhood [59]. They are a core feature but not considered to be core symptoms, as are positive and negative symptoms [60]. However, their presence and degree of dysfunction is taken as a better indicator of functionality than the presentation of core symptoms [59]. Cognitive deficits become worse at first episode psychosis but then return to baseline, and remain fairly stable over the course of the illness [61].

With regard to risk factors for schizophrenia, schizophrenia is described as a neurodevelopmental disorder without exact boundaries, or a single cause, and is thought to develop from genetic-environment interactions with vulnerability factors involved [2,62,63]. These risk factor interactions are complex, as they can involve numerous and diverse insults from pregnancy into adulthood [63]. A genetic predisposition by itself, without the interaction of environmental factors, would not lead to the development of schizophrenia [63]. The genetic component means that prenatal brain development is disturbed, and environmental influence influences postnatal brain development [64]. Evidence suggests that genetically susceptible children are more likely to be affected by environmental risk factors [64]. Regarding associated risk factors of schizophrenia in the current study, there was significant association with low income, loss work, smoking, Khat chewing, birth complications, low Apgar scores, older paternal age, the spring birth, and winter birth, parental socioeconomic status, childhood trauma, cannabis (marijuana) use in adolescence, family history of schizophrenia, hypertension and diabetics (Table 3). The previous risk factors have been mentioned by several researches [65-71]. Environmental, social, and economical factors, each associated with a slight risk of developing schizophrenia in later life include oxygen deprivation, infection, prenatal maternal stress, and malnutrition in the mother during prenatal development [65]. A risk is associated with maternal obesity, in increasing oxidative stress, and dysregulating the dopamine and serotonin pathways [66]. Both maternal stress and infection have been demonstrated to alter fetal neurodevelopment through an increase of pro-inflammatory cytokines [67]. There is a slighter risk associated with being born in the winter or spring possibly due to vitamin D deficiency [68] or a prenatal viral infection. Other infections during pregnancy or around the time of birth that have been linked to an increased risk include infections by *Toxoplasma gondii* and *Chlamydia* [69]. The increased risk is about five to eight percent [70]. Viral infections of the brain during childhood are also linked to a risk of schizophrenia during adulthood [71]. Adverse childhood

experiences (ACEs), severe forms of which are classed as childhood trauma, range from being bullied or abused, to the death of a parent. Other risk factors reported widely, include social isolation, immigration related to social adversity and racial discrimination, family dysfunction, unemployment, and poor housing conditions. Having a father older than 40 years, or parents younger than 20 years are also associated with schizophrenia [2].

Limitation of the study

There may be limitations in this study due to limitations in the research design as the research included only healthy subjects and it was preferable to enter a diseased groups for comparison. There may be other factors that were not addressed in this study, and these factors may affect the results of this study. However, putting forward these limitations should not undermine its research value in the eyes of readers and reviewers.

Conclusion

Although the results of the study did not prove causality, but based on the results, health and psychological education interventions should be developed to reduce the incidence of schizophrenia in Yemen and reduce the rate of need for inpatient services. Giving information about schizophrenia in Yemen followed by the development of community facilities for patients and their families enhances their contribution to the maintenance of the family, while it is important to know that strengthening the professional and social supportive network by reducing poverty and unemployment, raising awareness of the dangers of drugs and smoking, and providing some auxiliary facilities for critical periods for patients can reduce the burden of providing care and reduce the admission rate in psychiatric hospitals in Yemen.

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Conflict of Interest

No conflict of interest associated with this work.

Author's Contributions

This article is part of a research conducted by Dr. Sami Mohammed Abdo Hassan for his Ph.D., who carried out clinical and laboratory works with the assistance and supervision of Professor Hassan Al-Shamahy. Both contributed to the evaluation of clinical and laboratory findings, data analysis, and writing of the manuscript.

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