Autism Spectrum Disorder in AlBaha Region, Saudi Arabia: Perinatal Risk Factors, Presenting Complaints and Existing Services

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*Abstract :***Background: -** Autism spectrum disorders (ASD) are neurodevelopmental disorders that affects a child's communication and language skills. Its risk factors need to be better understood and identified. Early interventions can improve ASD children's communication skills.

Objectives: To investigate the socio-demographic characteristics, some of the perinatal risk factors, presenting complaints of ASD children and assess their parent's opinion toward provided services in AlBaha Region.

Methods: - Case control study was done on 65 ASD children attending Taatuf daycare rehabilitation center in AlBaha Region and 65 control from siblings of autistic children. We use structured questionnaire including Sociodemographic data, Sheet of pregnancy and birth complications, presenting complaints of ASD children and parents opinion to existing services through interviewing their parents.

Results: - Male children (83.1%), labor complications (15.4%), respiratory complications during labor (10.8%), post-natal Seizures (12.3 %) were higher among ASD children with statistically significant association. Social skills deficits appeared in (70.8%)of ASD children by the age of < 3 years (80%). Most of parents were not satisfied with provided services to ASD children in AlBaha region.

Conclusions:

- The most prominent risk factors for autism were males, exposure to labor complications, experiencing respiratory complications during labor, occurrence of post-natal seizures. Social skills deficits by the age of less than 3 years was the commonest complaint. Existing ASD services were not enough.

Keywords: - Autism, Perinatal Risk Factors, Complaints, Educational services, Rehabilitation Services, Health Services, AlBaha Region.

INTRODUCTION:

Autism spectrum disorder (ASD) is a neurodevelopmental disorder impacts a child's language and communication abilities. A child diagnosed with ASD may exhibit diminished capacity for social interaction , repetitive and limited behaviors . When it comes to their comprehension and application of verbal and nonverbal cues, body language and facial expressions, each child's condition will be unique [1]**.**

Males are more likely than females to have the illness, which is detected by the age of 3 in both sexes. Although the etiology of these illnesses is not fully understood, twin and family studies indicate that genetic factors are likely to be a major contributing factor [2]**.**

Maternal stress, rural residence and family history of autism are significant risk factors for ASD**.** Several studies indicated the presence of one or more unfavorable obstetric circumstances, such as breech presentation, gestational age at birth 35 weeks, and parental mental history, has been linked to an elevated risk for autism [3]. However, the relationship between pregnancy, birth problems, and other maternal factors and the onset of autism have been the subject of extensive research, although the exact cause of these interactions is still unknown [4].

The median age at which an ASD diagnosis is made in KSA is three years [5]. A study by the General Authority for Statistics states that 49,016 children in KSA have been diagnosed with ASD [6], which equates to one diagnosis for every 160 children [7].

Services for people with ASD may be obtained in the Kingdom of Saudi Arabia from both public and private sectors (specialist clinics, special needs facilities, hospitals, and schools). Not all children with ASD have access to these programs, even though all government-provided ASD services are free and some private institutions are charitable [8].

Improving the capacity of children with ASD and their parents to care for them is contingent upon providing support to both parties. Therefore, it is necessary to evaluate how satisfied parents are with the services their children get as well as how they perceive them [9].

The purpose of this study :is to investigate the socio-demographic characteristics, identify perinatal risk factors of autism, explore presenting complaints of ASD children and to assess their parent's opinion toward existing educational, rehabilitation, health Services in AlBaha region.

SUBJECTS AND METHODS :

Site of the study: Children enrolled in the study represent all autistic children attending Taatuf daycare rehabilitation center in AlBaha Region, Saudi Arabia and their siblings from November 2023 to January 2024

Study design: -case control study was done to assess possible risk factors that may be associated with autism.

Sample size: - was calculated using the open Epi Info 7 program According to power 80%, 95% CI, ratio of control to ASD cases was one and the expected percent of control exposed to respiratory complication during labor 11.7% and the expected percent of ASD children exposed to respiratory complication during labor 39.6% [4]. It was 110 children and after adding 15% non-response rate the total calculated sample size was 130 children they are divided equally in two groups .

Subjects of the study: - Group (1): ASD children: They are sixty-five children diagnosed with ASD their age ranged between 3 and 12 years old (54 of them were males and 11 were females) with a mean age of 7.20 ± 2.9 years - Group (2): control group was recruited from the preceding or succeeding siblings of autistic children (number=65) (31 of them are males and 34 are females with a mean age of 6.80 ± 2.5 years. They were not known to have any neuro-developmental or behavioral disorders that might be related to ASD. The diagnoses of ASD were established by an experienced psychiatrist based on the classification system stated in the Diagnostic and Statistical Manual of Mental Disorders fifth edition DSM-V criteria [10].

Tools of the study: The following tools and techniques were applied to both groups of the study in order to fulfill the aim of the work:

A-Sociodemographic data sheet (to both groups):

It consists of information about the age, sex, the children mother's and father's age at birth of the child, Difference in age between parents, Family members and income.

B. Sheet of pregnancy and birth complications (to both groups):

This sheet was designed to include questions covering the possible peri-natal risk factors which were reported to be related to autism in some research studies [11]. It covers aspects of three areas; prenatal, natal and postnatal periods. Each one covers the complications occurring during pregnancy, labor and early postnatal period respectively.

C. Detailed interviewing was done to parents to know presenting complaints observed by them which triggered them to seek medical advice. The presenting complaints were classified into three main categories 1-social skills deficits, 2-language skills deficits and 3-restricted interest or repetitive behaviors in addition to the age of the autistic child at which their parents noticed delaying growth and development.

D. Evaluation of existing services through asking parents of ASD about their opinions to the existing health, rehabilitation and educational services.

Ethical Issues: The proposal was approved by the Institutional Review Board (IRB) of King Fahd Hospital 04112022/3. This work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans. Informed consent was obtained from all participants of this study after explaining the objectives and the nature of the research to them.

Statistical Analysis: The collected data were organized, tabulated and analyzed using the SPSS version 22 for the statistical analysis. Categorical variables were demonstrated in number and percent and compared by using Chi-square. Significance was considered when p value was ≤ 0.05.

*Results***:**

I- Association between ASD and Socio-demographic characteristics (Table 1).

There was statistically significant association between sex and ASD in which (83.1% of ASD group were males and 16.9% were females. However, there was none statistically significant association between ASD, age, the children mother's and father's age at birth of child, difference in age between parents, family members and income.

II- Association between ASD and prenatal risk factors (Table 2)

There were none statistically significant association between ASD, consanguinity, family history, gestational infection, maternal diabetes mellitus, gestational hypertension, Pre-eclampsia, drug intake during pregnancy and vaccination during pregnancy.

III- Association between ASD and natal and post-natal risk factors (Table 3):

There was statistically significant association between ASD, occurrence of labor complications occurrence of respiratory complications during labor and seizures that 15.4% of ASD children exposed to labor complications, 10.8% of them experienced respiratory complications during labor and 12.3 %. develop post-natal seizures. While, there were none statistically significant association between ASD, other natal and post-natal risk factors like mode of delivery, Prematurity, Birth weight, jaundice, fever, neonatal infection and duration of breast feeding.

IV - presenting complaints of studied ASD children (Figure 1). More than two third of them (70.8%) developed social skills deficits, 23.1% had language skills deficits while 6.1% of them had restricted interest or repetitive behaviors.

V- Distribution of studied ASD children according to age of noticing abnormal growth &development (Figure 2). we found that 80% of ASD children develop delay of growth and development at less than 3 years while 20% of them start at 3 or more than 3 years.

VI - Evaluation of existing services for ASD children in AlBaha region through openion of their parents (Figure 3). Nearly three fourth of them (73.8%), 70.8 % and 60% of them revealed that existing educational, rehabilitation, health services respectively were not enough.

Discussion :

Our study revealed that higher level of ASD was among male children (83.1 %). This was similar to the study done in Saudi Arabia by [9] who found that 78.9% of ASD children were males. Also similar studies done in Egypt, China and Tunis where 85.7% and 85.3%, 78.4% respectively of ASD children were males respectively [2,11-12]. Also similar study was done by [13] who found that the risk of ASD was 3–4-times higher in boys than girls. This is generally consistent with the sex distribution of ASD worldwide. However, societal pressures and cultural issues should also be considered, where girls may be paid less attention for the sake of education and rehabilitation services.

Our study found significant association between autism and labor complication in which 15.4% of autistic children exposed to labor complication. Similar study done by Abd Elhameed et al 2011 who found that 21.4% of autistic children exposed to labor complication. also the study done by [12] Found that there was significant association between autism and difficult labor.

Our study found that (10.8%)of autistic children had respiratory complication during labor in comparison to 1.5% of control group with statistically significant association. Similar study done by [11] who found that 64.3% of autistic children had delayed crying during labor in comparison to 7.1% among control also, [12] Found that there was significant association between autism and Perinatal hypoxia in which Perinatal hypoxia occurred in (11.3%) of ASD group in comparison to (1.7%)in control group with statistically significant association. A similar study done by [4] found that 39.6% of ASD children had respiratory distress during labor in comparison to 11.7% among control.

Our study found that (12.3%)of autistic children had postnatal seizures in comparison to 1.5% of control group with statistically significant association. Similar study done by [12] Found that there was significant association between autism and postnatal epilepsy in which postnatal epilepsy occurred in (15.4%) of ASD group while it was absent in control group with statistically significant association.

Our study revealed that (70.8%)of autistic children had social skills deficit which was in agree with studies done by [14-17] who revealed that majority of young ASD children has delayed social relatedness and communication and the presence of restricted interests and repetitive behaviors. However, it was disagreeing with the study done by [18] who found that the majority of autistic children have intellectual disabilities and language delay.

Our study revealed that age of noticing abnormal growth &development was <3 years in 80% of ASD children. This was consistent with the study done by [9,15-16, 19-20] who found that diagnoses of ASD occurred in children as young as 15–48 months. This early age of diagnosis reflects increased awareness of both families and physicians, which facilitates early recognition and identification of ASD.

Early interventions significantly improved the cognitive, linguistic, and social-emotional functioning of children with ASD, highlighting the benefits of early ASD diagnosis. Early identification of ASD leads to early interventions that have been shown to enhance developmental outcomes for children with ASD [21].

However, our study revealed that 73.8%,70.8 and 60% of ASD parents were not satisfied with existing educational, rehabilitation and health services respectively and perceive it as not enough for their children. Similar studies in different geographical areas have reported unmet service needs for individuals with ASD and their families, [22-23] including a lack of medical, targeted therapy, school, job coaching, financial management, and services for young adults with ASD.

Also the study done by [9] found that 53.3% of parents having ASD children between 8-10 years were not satisfied with the Speech and Language Services Provided in Saudi Arabia. In the KSA, ASD rehabilitation centers found to have great shortages in terms of quality and quantity. Long waiting lists and shortages of qualified staff at daycare settings have been reported. [24-25].

This low levels of satisfaction toward provided health services may be due to that AlBaha region is considered as the smallest region in KSA and usually   better services are provided in major cities, whereas fewer services are provided in smaller cities. These limitations can adversely affect the caregivers' and the ASD children's quality of life.

Thus, the caregivers and the children with ASD must receive appropriate medical, psychological, and financial support. For example, to avoid unfavorable variations in healthcare services across cities, unified national centers with qualified staff can provide advanced healthcare services and affordable teaching and training sessions for caregivers [26-27].

Greater services are offered in larger cities whereas smaller cities offer fewer services. The quality of life for both the caregivers and the children with ASD may suffer as a result of these restrictions. Therefore, proper medical, psychological, and financial assistance must be provided to the caregivers and the children diagnosed with ASD. For instance, unified national centers with trained staff can offer sophisticated healthcare services as well as reasonably priced teaching and training sessions for caregivers, helping to prevent undesirable variances in healthcare services among cities [26-27].

Conclusion: - The most prominent risk factors for autism observed in our study were sex where ASD was common among males (83.1%), exposure to labor complications (15.4%), experiencing respiratory complications during labor (10.8%), occurrence of post-natal Seizures (12.3 %). The most common presenting complaints was social skills deficits (70.8%) by the age of less than 3 years (80%). Most of parents were not satisfied with existing educational, rehabilitation and health services in AlBaha region.

Limitations of the study: -

  The retrospective design and a limited sample size pose a major limitation to our study. The source of our data to identify perinatal risk factors was restricted to reviewing medical files. To further validate our results, a larger sample size may be considered in addition to adding a prospective arm to the study. Furthermore, although the DSM-5 diagnostic criteria were used to diagnose ASD by experienced psychiatrist, other research diagnostic tools such as the Autism Diagnostic Interview-Revised (ADI-R) and Autism Diagnostic Observation Schedule-2 (ADOS-2) were not administered.

  Although awareness of ASD in the KSA and wider Middle East is on the rise, there exists a perceived stigma toward mental health, as do other barriers such as high cost of mental health among individuals from diverse nationalities residing in the region. These limitations may adversely affect the generalizability of studies such as ours.

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Table (1): - Association between ASD and Socio-demographic

   characteristics among studied groups

Variables	ASD group (No. 65)		Control group (No. 65)		χ2	P-value
	No.	%	No.	%		
Age						
▪ <5	28	43.1	31	47.7	0.279	0.597
▪ ≥5	37	56.9	34	52.3		
Sex						
▪ Females	11	16.9	34	51.5	17.4	<0.001*
▪ Males	54	83.1	32	48.5		
Mother age at child's birth (years)						
▪ < 35	51	78.5	47	72.3	0.663	0.415
▪ ≥35	14	21.5	18	27.7		
Father age at child's birth (years)						
▪ < 40	48	73.8	46	70.8	0.153	0.695
▪ ≥40	17	26.2	19	29.2		
Difference in age between parents (years)						
▪ < 10	54	83.1	52	80.0	0.204	0.651
▪ ≥10	11	16.9	13	20.0		
Family members						
▪ ≤ 4	38	58.5	38	58.5	0.00	1.0
▪ .>4	27	41.5	27	41.5		
Income						
▪ Low	8	12.3	8	12.3	0.00	1.0
▪ Moderate	36	55.4	36	55.4		
▪ High	21	32.3	21	32.3		

   χ2 =Chi square test   *Significant *

Table (2):- Association between ASD and prenatal risk

factors among studied groups

Prenatal risk factors	ASD group (No. 65)		Control group (No. 65)		χ2	P-value
	No.	%	No.	%		
Consanguinity						1.0
▪ Not related	2	3.1	2	3.1		
▪ First degree	11	16.9	11	16.9	0.00	
▪ Second degree	22	33.8	22	33.8		
▪ Third degree	30	46.2	30	46.2		
Family risk factors						1.0
▪ No Family history of ASD	48	73.8	48	73.8	0.00	
▪ Family history of ASD	9	13.8	9	13.8		
▪ Sibling history of ASD	1	1.5	1	1.5		
▪ Other psychiatric family history	7	10.8	7	10.8		
Gestational infection	4	6.2	1	1.5	1.872	0.171
DM	9	13.9	3	4.6	3.305	0.069
Ges. HTN	3	4.6	2	3.1	0.208	0.648
Pre-eclampsia	2	3.1	1	1.5	0.341	0.559
Drugs	10	15.4	5	7.7	1.884	0.169
Vaccination	19	29.2	21	32.3	0.144	0.703

χ2 =Chi square test   *Significant *

Table (3): -   Association between ASD and natal and post-natal risk factors among studied groups.

Natal risk factors	ASD group (No. 65)		Control group (No. 65)		χ2	P-value
	No.	%	No.	%		
Delivery						0.247
▪ Vaginal delivery	43	66.2	49	75.4	1.338	
▪ Cesarean section	22	33.8	16	24.6		
†Labor complications	10	15.4	3	4.6	4.188	0.041*
Prematurity					0.433	0.51
▪ No						
▪ Yes	59	90.8	61	93.9		
	6	9.2	4	6.1		
Birth weight (kg)						
▪ <2.5					0.044	0.833
▪ ≥2.5	14	21.5	15	23.1		
	51	78.5	50	76.9		
††Respiratory complications	7	10.8	1	1.5	4.795	0.028*
Post-natal risk factors						
Jaundice	3	4.6	2	3.1	0.208	0.648
Fever	2	3.1	1	1.5	0.341	0.559
Seizures	8	12.3	1	1.5	5.849	0.015*
Neonatal infection	4	6.2	1	1.5	1.872	0.171
Breastfeeding (months)					0.509	0.776
▪ < 6	7	10.8	6	9.2		
▪ 6 to 12	36	55.4	40	61.5		
▪ >12	22	33.8	19	29.3		

χ2 =Chi square test   *Significant

†Labor complications include prolonged labor done at home, by other medical personnel, Preterm or post term, aided delivery (forceps or ventose) or C.S. **†† respiratory complications** (hypoxia, Distressed baby during labor, delayed crying,…..etc
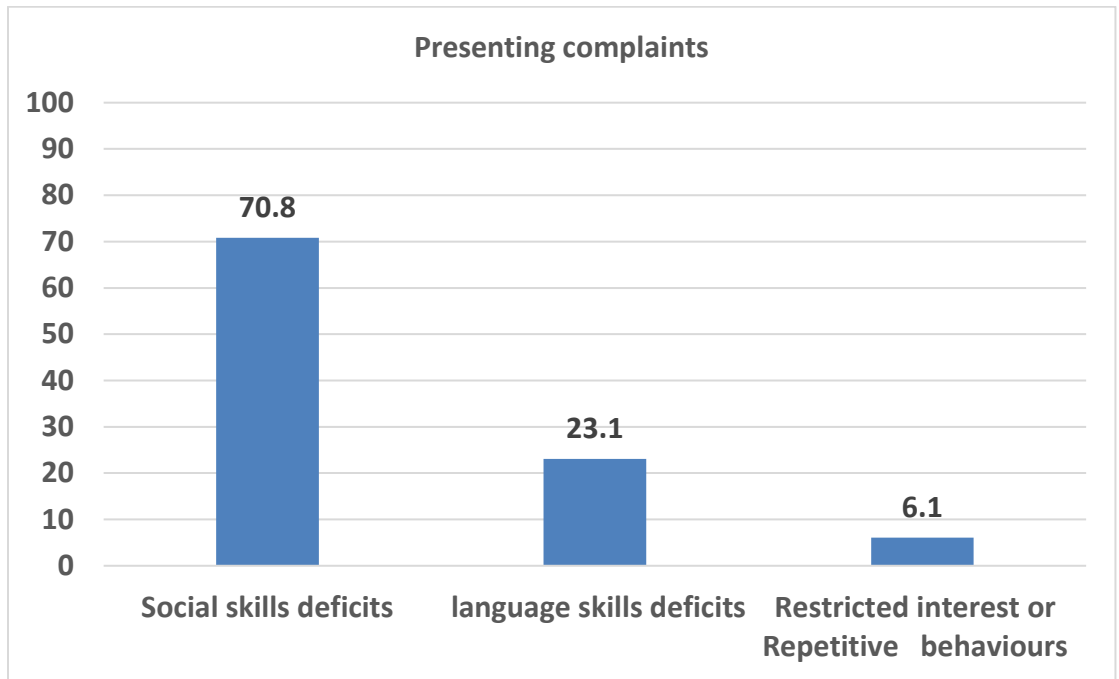
Figure (1): - presenting complaints of studied ASD children.
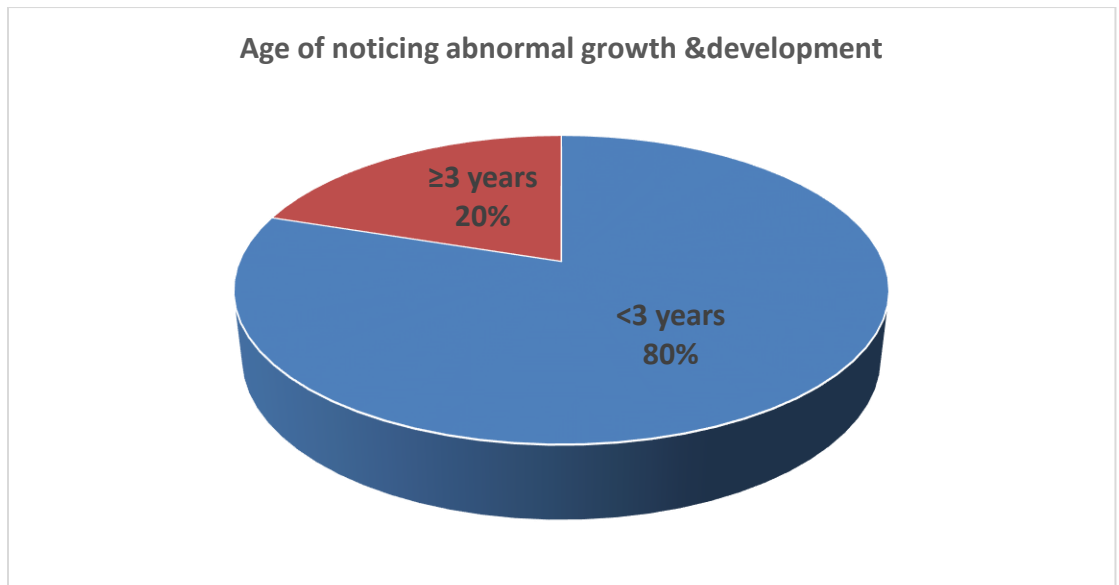

Figure (2): -Distribution of studied ASD children according to age of noticing abnormal growth &development
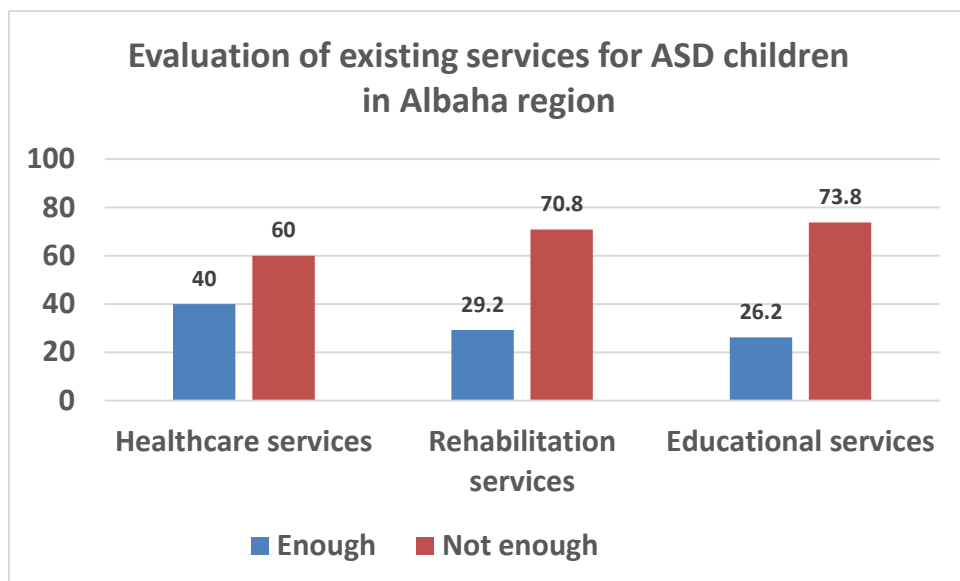
Figure (3): - Evaluation of existing services for ASD children in Albaha region through openion of their parents

Disclosure: -The authors report no conflicts of interest in this work.