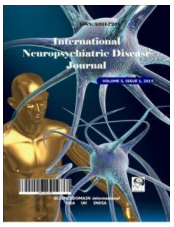

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Autism Spectrum Disorder in North-Western Nigeria

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Authors' contributions

This work was carried out in collaboration between all authors Author MMA conceived the idea of the study and was involved in the study design, first draft, literature searches and final reading and approval of the study. Author HA was involved in the study design, protocol writing and final reading and approval of the study. Authors JB, JFL, AMN, MO and AAT were involved in data collection and analysis as well as reading and approval of the study. All authors read and approved the final manuscript.

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ABSTRACT

Aim: To determine the profile of autism spectrum disorder (ASD) cases in a tertiary hospital in Sokoto, over a decade.
Study Design: A descriptive study on the clinical presentations and associated co-morbidities in children with ASD as seen in Usmanu Danfodiyo University Teaching Hospital (UDUTH) Sokoto.
Place and Duration of Study: Department of Paediatrics (Neurology Unit), UDUTH Sokoto, Nigeria, between July 2008 and June, 2018.
Methodology: Children with documented features of ASD (as described in DSM-5) over the study period were enrolled. Relevant information was extracted from the hospital records. The DSM 5 diagnostic criteria for ASD was applied, and all cases whose clinical records conform to the DSM 5 criteria, and having complete clinical records were included. Patients with incomplete data were excluded. Co-morbid conditions were identified based on history and examination records. A descriptive analysis of the data was done and presented as frequencies and proportions.
Results: Out of the 1267 cases seen in Paediatric Neurology clinic over the study period, 18 cases exhibited the symptoms of ASD based on the DSM 5 criteria, giving a hospital prevalence of 1.4%.

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The mean age at diagnosis was 5.6 ±2.5 (range 2 to 13) years, with a M:F of 1:1.6. All the cases had the core symptoms of impaired social communication, impaired social interactions and restricted/stereotypic behaviours that started before 3 years of age. Majority (55.6%) of the cases were diagnosed after the age of 5 years. Identified co-morbidities include hyperactivity (55.6%), seizures (33.3%) and motor delays (27.8%), occurring alone or in combinations. Only 4 (22.2%) of the cases had no identifiable neuro-developmental co-morbidities.

Conclusion: Autism spectrum Disorder is one of the neurodevelopmental disorders among children with Neurologic problems in our centre and is commonly associated with other co-morbidities. There is need to create more awareness about ASD so as to enhance its early recognition and appropriate interventions.

Keywords: Autism; co-morbidity; disorder; Sokoto; UDUTH.

1. INTRODUCTION

Autism Spectrum Disorder (ASD) is a group of life-long neuro-developmental disorders characterized by impairments in social communication, social interaction and stereotypic or restrictive interests/behaviours [1]. These symptoms must not be better explained by intellectual disability or global developmental delays [2]. ASD usually manifest in the first 2-3years of life and more males are shown to be affected [1,3,4,5].

Globally, its prevalence is rising particularly in the past 2-3 decades, due to increased recognition and knowledge of the disorder [4,6]. However, there is still dearth of information on ASD in Nigeria and many sub-Saharan African countries [4,7-10]. A systematic review of research done on autism in sub-Saharan Africa in 2016 indicated that current evidence base is too scanty to give required information on childhood ASD in Africa [8]. In Nigeria, it is estimated that one out of every 125 to 150 children are living with the disorder, giving a total of about 600,000 children [7].

The exact aetiology of ASD is not known and still being studied. However, the risk of having a child with ASD have been linked to the potential impact of multiple factors such a genetics, biological, environmental and cultural factors [4,11]. Diagnostic tools are available for evaluating children with suspected ASD, but most of them have not been validated for the African context [8,12]. Therefore, most of diagnoses are still based on comprehensive clinical evaluation of the child's behavior and development based on history and observation of the child [6].

Wannenburg et al. [13] has identified some key areas that require timely attention in Africa, including more trained personnel and development of appropriate screening tools and financially feasible interventions. The ASD has multiple impacts on the child's social and educational achievements, [7] but the education related aspect has received even much less attention in the African region [7,9]. A study in Nigeria has demonstrated that primary school children with ASD had significantly lower intelligence as compared to those without ASD [5]. Furthermore, most ASD cases tend to co-exist with other neuro-developmental co-morbidities particularly epilepsy, hyperactivity or intellectual disability [5-7,10,14,15].

To the best of the investigators knowledge, there was no report on the profile of ASD in our area (covering Sokoto, Kebbi and Zamfara states) North-Western Nigeria. Therefore, this hospital based-study aims to determine the profile of autism spectrum disorder (ASD) cases in our hospital, over a decade. It will also serve to provide a baseline data on ASD in our locality as well as to stimulate more focused research on this developmental disorder in Nigeria and Africa.

2. SUBJECTS AND METHODS

This was a descriptive retrospective study on the clinical profile of ASD (based on clinical records) in children seen at Paediatric Neurology Clinic of Usmanu Danfodiyo University Teaching Hospital (UDUTH) Sokoto, over a decade (July 2008 to June 2018). The Paediatric Neurology Clinic serve as a referral clinic for all Paediatric Neurology cases from neighboring Sokoto, Kebbi and Zamfara states.

The study population was that of children with documented features of ASD based on DSM-5 criteria. Although the DSM 5 diagnostic criteria was developed in 2013, it was applied on all the cases and only those that conform with the

criteria and having complete clinical records were included. Patients' information was extracted from the medical records, including all relevant clinical and developmental informations using a data extraction form.

Twenty-three (23) cases were identified to have a diagnosis ASD over the study period. However, only 18 of them satisfied the DSM-5 criteria and were enrolled. Two patients had Rett syndrome features and 3 others had incomplete data and all the 5 were excluded. Co-morbid conditions were also identified based on history and physical examination records. A descriptive analysis of the data was done and presented as frequencies and proportions.

3. RESULTS

Out of the 1267 Paediatric Neurology cases seen in the clinic over the period, ASD accounted for 18 cases, giving a prevalence of 1.4%. All the cases had the core symptoms of impaired social communication, social interactions and stereotypic behaviours that started within the first 3 years of age.

The mean age of the cases at diagnosis was 5.6 ±2.5 (range 2 to 13) years, with a male to female ratio of 1:1.6. More than half of the cases, 10 (55.6%) were diagnosed after the age of 5 years as shown in Table 1.

Table 1. Demographic characteristics of the 18 ASD cases

	Frequency	%
Age at diagnosis (years)		
2-5	08	44.4
6-13	10	55.6
Gender		
Male	07	38.9
Female	11	61.1

Identified co-morbidities with the ASD include hyperactivity (55.6%), seizure disorder (33.3%) and motor delays (27.8%) either alone or in combinations as shown in Table 2. Only 4 cases (22.2%) had no other identifiable neurodevelopmental co-morbidities.

None of the ASD cases presented with motor delays alone as co-morbidity. Brain computed tomography (CT) scan was available in only 7 out of the 18 cases (38.9%). The CT findings were reported to be normal in 5 out of the 7 cases (71.4%), while features of brain atrophy were observed in the remaining 2 (28.6%) cases.

Table 2. Identified co-morbidities among the ASD cases

Co-morbidities	Frequency	%
Seizure disorder only	02	11.1
Hyperactivity only	06	33.3
Hyperactivity & Motor delay	02	11.1
Hyperactivity & Seizures	02	11.1
Motor delays & Seizures	02	11.1
No co-morbidity identified	04	22.2
Total	18	100

4. DISCUSSION

Autism spectrum disorder is one of the pervasive neurodevelopmental disorders whose exact cause is still unknown and there is no laboratory test used to confirm ASD. Its diagnosis therefore rests on clinical history and assessment of the child's behavior and development [6].

The clinical diagnosis mainly rely on two main sources of information—parents' or caregivers' descriptions of the child's behaviour and development, as well as a professional's observation of the child's behavior. This is particularly important in the African setting where most of the diagnostic rating scales have not been validated for local application [12].

This study was hospital based, aimed at stimulating more focused research on ASD in our communities, due to its potential impact on child's social development and learning abilities [4,5,7,8]. There is no established prevalence rate for ASD in Nigeria and many parts of Africa. However, few reports in Nigeria have given estimates of the burden of ASD in their localities. Lagunju et al. [10] have reported a hospital prevalence of 2.3% among children with neurologic disorders in South-western Nigeria. Whereas, Chinawa et al. [16] reported a prevalence of 2.9%, among school children in South-East Nigeria. Both rates are higher than our finding of 1.4%. This may be attributable to possible cultural differences in health seeking behaviour of Nigerians. Moreover, Chinawa's study [16] was school based, in contrast to ours that is hospital based.

Several studies have indicated more male than female affection, [10,14,17]. However, Chinawa et al. [16] showed no gender difference in their study cohort. This is contrary to our observation, where more females were affected. This could be attributable to the fact that, our study is hospital-based and may not be a good reflection of the community pattern of the disorder. Also, the

small sample involved may be a contributing factor to the difference observed. Further local community based prevalence studies would be needed to address some of these issues.

Based on the timing of presentation, most of the cases in our study presented rather late, with less than half of the cases receiving a diagnosis at or before the age of 5 years. This finding is in line with previous observations from the African region [10,12,17,18] that many children with autism in Africa tend to present late when compared to those from more resourceful environments. This may be due to lack of knowledge about the disorder or cultural believes that the disorder is better handled traditionally or spiritually. Also, inadequate skilled manpower with poor capacity to diagnose the cases may be a factor, [17] particularly at the primary and secondary health facility levels where many of these children will first present.

Many developmental co-morbidities have been reported to co-exist with ASD particularly epilepsy, hyperactivity or intellectual disability [5,10,14,15,17]. In this study, hyperactivity was the commonest comorbidity identified in more than half of the cases, followed by epilepsy. This is similar to the report by Oshodi et al. [17] in Lagos, whereas Lagunju et al[10] found epilepsy to be the most common co-morbidity among their subjects.

A frequent symptom overlap has been shown to exist between ASD and attention-deficit hyperactivity disorder, which may co-occur in 30-80% of cases [19]. Intellectual disability and epilepsy are the commonest comorbidities reported by Bakare et al. [14] and Mpaka et al. [15] in their series. This observation concur with the findings of Ekanem et al. [5] who demonstrated lower mean intelligent quotient (IQ) scores among children with autism attending mainstream primary school in Uyo, Southern Nigeria. Our study however, did not assess the cognitive performance of the subjects, due to lack of adequate record about it.

Although there are no conventional brain CT findings that are pathognomonic of ASD, more than two-third of our subjects in whom brain CT scans were obtained had a normal report, while features of brain atrophy were the only abnormalities identified in less than one-third of the cohort. More advanced functional neuroimaging modalities are becoming important investigative tools, useful in the diagnostic evaluation of ASD. However, in economically deprived parts of the world, brain CT scan is still useful in excluding other organic brain pathologies such as tuberous sclerosis that may mimic ASD presentations.

Despite the fact that ASD has no cure, its recognition and early intervention in form of specialized education, behavioural and speech therapies and other support services will help the affected children.

5. CONCLUSION

Autism spectrum Disorder is one of the neurodevelopmental disorders among children with neurologic problems seen in our center. It is associated with other co-morbidities, particularly hyperactivity and epilepsy. There is need to create more awareness about ASD so as to enhance its early recognition and appropriate interventions such as behavioural and speech therapies, specialized education and other support services.

6. RECOMMENDATION

More community-based studies on ASD and its aetiological/risk factors are needed in Nigeria and the entire African sub-region, so as to establish the exact burden of this behavioural developmental disorder in the sub region.

CONSENT

It is not applicable.

ETHICAL APPROVAL

Ethical approval was obtained from the ethics committee of the Hospital.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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