



## **Childhood Autism in a 3-Year Old Male Nigerian Whose Mother was diagnosed with Hepatitis C Virus Infection during Pregnancy: A Case Report**

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### **Authors' contributions**

*This work was carried out in collaboration between both authors. Author MNI wrote the draft of the manuscript and did the literature searches. Author NAA contributed to the correction of the draft. Both authors read and approved the final manuscript.*

### **Article Information**

DOI: 10.9734/IJMPCR/2015/18371

#### Editor(s):

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Complete Peer review History: <http://sciencedomain.org/review-history/9968>

**Case Study**

**Received 18<sup>th</sup> April 2015**  
**Accepted 1<sup>st</sup> June 2015**  
**Published 29<sup>th</sup> June 2015**

### **ABSTRACT**

**Introduction:** Childhood autism is a pervasive developmental disorder presenting with a distinct pattern of impairments in social relationships and communication with repetitive/stereotyped behaviour. Multiple aetiological factors have been established and viral infections that occur very early in development have been proposed as possible aetiological factors.

**Case Presentation:** This article reports a case of childhood autism in a 3-year old male Nigerian whose mother was diagnosed with hepatitis C virus (HCV) infection during pregnancy.

**Conclusion:** The observation in this case report of childhood autism in a 3-year old male Nigerian whose mother had HCV infection during pregnancy raises the question of a possible association between childhood autism and HCV.

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**Keywords:** *Childhood autism; hepatitis C virus; pregnancy.*

## 1. INTRODUCTION

Childhood autism was first described by Leo Kanner in his classical paper titled 'Autistic disturbances of affective contact' which was published in 1943 [1]. Data suggest that autism results from multiple aetiologies with both genetic and environmental contributions, which may explain the spectrum of behaviours seen in this disorder [2]. Aetiology of childhood autism has also been reported to be influenced mainly by genetic factors [3]. Childhood autism is associated with intellectual disability and seizure disorder in a significant number of cases [3,4]. In addition, it has been reported that the risk of autism is associated with advanced parental age, diabetes mellitus, bleeding and use of antipsychotic drugs in the mother during pregnancy [5]. Indeed, many causes of childhood autism have been proposed [6]. However, one proposed aetiology for autism is viral infections that occur very early in development [2].

## 2. CASE PRESENTATION

MN is a 3-year old male from the south-eastern region of Nigeria in sub-Saharan Africa. The first psychiatric service contact with the patient had been following a referral from the Neurology unit of Paediatric Department in a Teaching Hospital at the age of 2 years 8 months. The mother to MN had noticed that he was unable to develop speech and incapable of verbal communication at 2 years of age. He however babbled and heard others as he responded to instructions whenever he chose to do so. All that he talked which had meaning was 'mama'. This prompted the mother to consult a paediatrician when MN was 2 years old, who subsequently referred him for psychiatric evaluation.

About the same time, the mother to MN noticed that he was running round the house excessively and most times made loud shrill cries without reason. Efforts at restricting him from the persistent movements were resisted and the patient would react by beating the caregiver or himself repeatedly.

The patient was always in a world of his own. He seemed not to care about events around him. He avoided eye to eye contact and never responded to gestures made towards him. When gifts were offered to him or his name called, he often made no reciprocal response. He played with a

particular toy most often and enjoyed listening to a particular music from the mother's phone. At the nursery school where he attended, the teacher reported that he never communicated with fellow pupils but always busy playing alone. He had not established friendship with any of his peers. He did not interact with siblings at home and when the parents left or returned to the house, he showed no sign of seeing them. Whenever MN was hungry, he would only go to the kitchen and pick up a cup or plate and start crying. Gross motor development was said to have been normal when compared to his siblings. Developmental impairments were restricted essentially to the areas of communication, social interaction and repetitive/restricted behaviors.

### 2.1 Medical History

MN had two episodes of seizures at 7 months and 2 years of age respectively. During each of the two episodes, there was no history of fever to suggest that the seizures were caused by infections. It is probable that the seizures were associated with the autistic behaviors.

### 2.2 Family History

He is the second child in a monogamous family setting of 3 children. The first sibling died at the age of 6 months from a febrile illness. The younger sibling is alive and well. The father is a 35-year old business man while the mother is a 28-year old certified nurse/midwife working in a tertiary health institution. The parents could not recall any history of psychiatric illness or seizure disorder among close relatives from both sides of the family.

### 2.3 Personal History

Pregnancy was carried to term and the mother received routine ante-natal care at a tertiary health facility under the care of a consultant obstetrician. She tested positive to serological testing for hepatitis C virus during the pregnancy. She was not symptomatic at the time of diagnosis and it was not possible to ascertain when she got infected with the virus. The testing for hepatitis C was done as part of routine investigations during pregnancy at the centre where the mother to MN received ante-natal care. Unfortunately viral load and hepatitis C

RNA were not done because the hospital lacked facilities for such investigations at the period. In addition, the mother to MN was subjected to liver function test, retroviral screening, serology for syphilis, haemoglobin estimation, blood grouping and genotype. There were no abnormalities detected. She was subsequently given ribavirin (antiviral) medication in addition to routine haematinic drugs. Labour and delivery were uneventful. The patient cried at delivery and gross motor development progressed well compared to other siblings. He was immunized fully as at when appropriate.

## **2.4 Mental State Examination**

During the examination, the young boy was clean and properly dressed. He was not co-operative and exhibited hyperactivity. He made loud pitched, incoherent and irrelevant sounds. Further assessment was not possible as MN was entirely detached from the interview and was in a world of his own.

## **2.5 Physical Examination**

Gross examination of the central nervous system revealed no hearing or visual impairments. There were no motor abnormalities or sensory deficits. Examinations of other systems were essentially normal.

## **2.6 Laboratory Investigations**

Basic laboratory investigations including liver function and serum electrolyte, urea and creatinine tests revealed no significant abnormality. An electroencephalogram and magnetic resonant imaging investigations were essentially normal. Audiometric evaluation also showed bilateral normal hearing. MN tested negative to hepatitis B and C virus.

## **2.7 Psychological Investigation**

There was no formal intelligent quotient test carried out on this patient because of the confounding factors of his age and unco-operative attitude.

## **2.8 Diagnosis**

Based on the history, mental state examination, physical examination and laboratory invest-

tigations with co-morbid seizure disorder, a diagnosis of childhood autism was made.

## **2.9 Treatment**

A multi-disciplinary approach of management involving the psychiatric nurses, clinical psychologists and psychiatrists was instituted. Low dose methyl phenidate was prescribed and this effectively reduced the hyperactive behaviour. He has been enrolled into a special education centre run by the Catholic Church for nursery school education.

## **3. DISCUSSION**

MN was diagnosed to have childhood autism at the age of 2 years. In a study by Siegel et al. [7] the mean age at which parents reported concerns about their children was 18.3 months, the mean age at which children received their initial diagnosis was 30 months, and the age at which children received a definitive diagnosis was 54 months. Another study reported that the average age at diagnosis for children with autism is 30 months [8]. MN's mother is a certified nurse and it is not surprising that she was able to express concerns about her child before he was 3 years of age. Studies have reported that children of more educated mothers are more likely to receive medical and psychosocial services than children of less educated mothers [9,10]. Childhood autism often has co-morbid intellectual disability and seizure disorder [3,4,11]. MN had two episodes of seizure prior to presentation at the age of 7 months and 2 years respectively. His intelligence quotient could not be assessed.

A study that assessed the risk factors for autistic spectrum disorders at Assiut city, Egypt reported that vast majorities (97.9%) of studied children have no family history of autism and that all mothers of studied children had also no history of rubella, diabetes, thyroid and infectious diseases [11]. Findings indicate that advancing parental age increases risk of childhood autism. Although recent attention has emphasized the effects of older fathers on the risk, an increase in the number of years in maternal age has greater implications for childhood autism risk than a similar increase in paternal age [12]. The father to MN was 35 years while the mother was 28 years. None of the parents was advanced in age.

Hepatitis C virus infection is a major disease burden on the world with estimated prevalence of 2.2% corresponding to about 130 million HCV-positive persons worldwide [13]. The seroprevalence of anti-HCV in Nigeria has been reported to be 4.7% [14]. There has been report that traces of polyomaviruses are more likely to crop up in postmortem brain tissues of individuals with autism than in that of healthy controls [15]. Also polyviral infections tend to occur more frequently in the brains of patients with autism compared to controls [15]. However, the mechanism by which viral infection may lead to childhood autism is not yet known. The mother to MN received ribavirin during pregnancy. There are reports that ribavirin has demonstrated significant teratogenic and/or embryocidal effects in all animal species in which adequate studies have been conducted. However, there are no controlled studies in human beings [16].

Though the mother to MN tested positive to hepatitis HCV during pregnancy, his own results were negative to both HCV and hepatitis B virus when seen by the psychiatrists. Whether HCV infection during pregnancy or the use of ribavirin in treatment had any relationship with MN developing childhood autism is an issue that remains to be fully established.

#### 4. CONCLUSION

The observation in this case report of childhood autism in a 3-year old male Nigerian whose mother had HCV during pregnancy raises the question of a possible association between childhood autism and HCV. More studies into the relationship between childhood autism and viral infections during early development are desirable. These may provide useful clues into the aetiology of childhood autism.

#### CONSENT

Written informed consent was obtained from the mother of this patient for publication of this case report.

#### ETHICAL APPROVAL

It is not applicable.

#### COMPETING INTERESTS

The authors declare that they have no competing interests.

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