

## Obstetric Risk Factors and Subsequent Mental Health Problems in a Child Psychiatry Clinic Population in Nigeria

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### Abstract

**Background:** Studies suggest that obstetric complications are associated with several child psychiatric conditions. In planning for child psychiatric services it is important to monitor patterns of morbidity and associated risk factors. Identifying obstetric risk factors in a newly opened child psychiatric clinic population with provide crucial information for future planning and collaboration.

**Objective:** To determine the prevalence and pattern of obstetric risk factors and associations with morbidity found in a child psychiatric clinic population.

**Method:** The study population consisted of all attendees at a newly opened child and adolescent psychiatric clinic at the University College Hospital, Ibadan. All attendees had a standardised comprehensive psychiatric assessment and an obstetric history was obtained from mothers.

**Results:** In the period under study, 144 children and adolescents were referred to this clinic. Obstetrical complications were found in 32 (29%) of the 112 children from whom this history was obtained. The commonest complications were birth asphyxia (11%), and emergency caesarean sections (6%). Delivery complications were associated with unskilled fathers' ( $x^2=8.4$ ;  $p=0.015$ ) and mothers above 40years of age, ( $x^2=9.5$ ;  $p=0.011$ ). Children with mental retardation were more likely to have suffered birth injuries ( $x^2=14.05$ ;  $p=0.000$ ). The highest number of obstetric complications occurred in children with disruptive behaviour disorder (42.9%), and autistic disorder (33.3%). No statistically significant relationship was found between specific groups and obstetric complications.

**Conclusion:** This descriptive study illustrates that obstetric complications are a contributing factor to mental health problems in children. Many of the complications could have been prevented with better health care. Further study may also want to compare obstetric complications in this child psychiatric clinic population with a sample of children in the general population.

**Keywords:** obstetric risk factors, child psychiatric disorders

### Introduction

Brain development is most at risk to disruption during the rapid phase of neuro-genesis. Two major types of disruptions of normal development have been described; the first is due to abnormal genes or chromosomes while the other, which is the focus of this study, is due to changes in the intrauterine environment due to abnormalities of pregnancy such as rubella and alcohol or a traumatic delivery process.<sup>1</sup> The neuron is a highly specialised cell and therefore very sensitive to changes in its biochemical environment, especially its supply of oxygen and glucose. Injury and local brain disease can cause loss of brain tissue however, studies indicate that the direct injury to the brain at birth is not the most destructive force but the anoxia and hypoglycaemia that are induced.<sup>1</sup> These pre- and perinatal issues and their attendant complications are very critical for study because of the specific and non-specific effects which may occur in the child.

Birth injury has been associated with specific gross and clearly defined abnormalities such as cerebral palsy, epilepsy and mental retardation and other non-specific effects less easy to define but associated with several child psychiatric conditions such as attention deficit hyperactivity disorder, learning disorders, schizophrenia and autistic disorder.<sup>2</sup>

Nigeria has one the world's highest rates of perinatal and maternal morbidity and mortality.<sup>3</sup> The impact of these rates on the mental health of the Nigerian child is yet to be quantified.

At the University College Hospital, a child and adolescent psychiatric outpatient clinic commenced operations in 2000. An audit cycle was built into the clinic routine to monitor and evaluate different aspects of this facility. One aspect of this audit process was to review the frequency and pattern of obstetrical complications in children and adolescents referred to this facility with a view to utilising this information for planning. This would also include identifying potential areas for collaborative efforts with health workers in other specialties such as obstetrics and gynaecology, paediatrics and public health. This study therefore identifies the prevalence and pattern of pre and perinatal complications in this clinic population and consequent mental health problems in the child or adolescent.

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## Method

At the University College Hospital, Ibadan, Nigeria, a separate child and adolescent psychiatric clinic commenced services 4 years ago. Prior to the commencement of services in this clinic, children and adolescents were seen as a part of a general psychiatry clinic. At the start of this service, a standardised assessment procedure was built into the clinic routine.

This assessment consists of a psychiatric interview followed by the completion of a semi-structured questionnaire using 'The Clinical Interview Form for Child and Adolescent Patients'.<sup>4</sup> This questionnaire contains questions pertaining to the child's development, medical, academic, social and psychiatry history. This interview form was selected because of the comprehensive information obtained, its clinical setting applicability, usefulness for preparing clinical reports and the fact that it can be used to set up a database of information.<sup>4</sup> At the end of this assessment, a clinical psychiatric diagnosis is made. The presence or absence of mental retardation in each child is also determined.

### *Obstetric History*

As a part of the parent interview, a detailed prenatal and perinatal history is obtained. The prenatal history obtains information about the mother such as health during pregnancy, age at delivery, and use of drugs and substances during pregnancy and delivery.

The peri-natal history obtains information about eclampsia, duration of pregnancy and labour, indications of fetal distress during labour, mode of delivery, child's birth weight and health complications following birth.

Information about obstetric complications were divided into three aspects:

- ◆ Pregnancy complications
- ◆ Delivery complications
- ◆ Birth injuries and other problems

All assessments were carried out by the author who is in charge of the child and adolescent clinic or a by resident who had been trained by the author and whose findings were reviewed by the author.

### *Analysis of Data*

Statistical analysis was by means of the Statistical Package for the Social Sciences, SPSS-10.1. Statistical significance was set of  $p < 0.05$  (two-tailed test).

## Results

Over the four-year period under study, 144 children and adolescents were referred to this unit. There were 88 (61%) males and 56 (39%) females. The mean age of attendees was 12.13 (SD: 3.9) with a preponderance of boys at all age groups. Three quarters, 110 (76%) of the children were from Christian homes, 28 (19.4%) from Muslim homes while 6 (4.0%) could not be placed. With

regards to the fathers' occupation, 35 (24 %) were professional, 70 (49%) middle level and 12 (8%) unskilled. Eight (6%) of the mothers had a university education, 99 (69%) a secondary school education or more and 13 (9.0%) had a primary school education and below. The fathers' occupation in 27 (19%) attendees and the mothers' the educational level in 24 (17%) attendees could not be ascertained because they were living in special circumstances such as institutions or in a village for abandoned or orphaned children.

### *Psychiatry clinical disorders*

The psychiatric clinical disorders found in this group were conflated into six groups as follows:

- ◆ Schizophrenia 15 (10%)
- ◆ Other psychotic disorders (includes acute psychotic disorders, psychotic disorders due to general medical conditions and bipolar disorders) 42 (29%),
- ◆ Autistic disorder 13 (9%),
- ◆ Disruptive behaviour disorders (conduct, ADHD, oppositional defiant) 26 (18%)
- ◆ Epilepsy 17 (12%)
- ◆ Other disorders (depressive disorder, enuresis, conversion disorder, pica, narcolepsy, suicidal behaviour, challenging behaviour) 18 (13%).

Thirteen children (9%) who presented to this setting did not have a psychiatric clinical disorder.

### *Mental retardation*

Forty-six (40%) of the children and adolescents who presented to this setting were diagnosed as having mental retardation. The 13 children or adolescents who did not have a psychiatric clinical disorder were among those with a diagnosis of mental retardation.

Significantly more males than females had a diagnosis of mental retardation ( $\chi^2=4.7$ ;  $p=0.031$ ) and children aged 0-12 years were more likely to have a diagnosis of mental retardation than children 13 and above ( $\chi^2=6.9$ ;  $p=0.032$ ).

### *Obstetrical Complications*

An accurate pre- and perinatal history could only be obtained from 112 (78%) of the 144 children who presented at this clinic. Data was not available for 32 children due to their peculiar circumstances. Obstetrical complications were found in 32 (29%) of the 112 children from whom this history was obtained. The commonest complication found among clinic attendees was birth asphyxia occurring in 11%, followed by emergency caesarean sections (CS) for reasons such as cephalo-pelvic disproportion (CPD), breech presentation, placenta praevia, abruptio-placentae occurring in 6%. (See Table 1).

**Table 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS N=144**

Gender	N (%)
Male	88 (61)
Female	56 (39)
<b>Age</b>	
6years and below	16 (11)
7 to 12 years	53 (37)
13years and above	75 (52)
<b>Religion</b>	
Christian	110 (76)
Muslim	28 (20)
Not known	6 (4)
<b>Fathers occupation</b>	
Professional	35 (24)
Middle leve	70 (49)
Unskilled	12 (8)
Not known	27 (19)
<b>Mothers level of Education</b>	
University	8 (5)
Secondary and tertiary (not university)	99 (69)
Primary and below	13 (9)
Not known	24 (17)

**Obstetrical complications and socio-demographic variables**

There were no gender differences in obstetrical complications but the younger children were significantly more likely to have complications. For children aged 0-6, 58.3% had obstetrical complications, for ages 7-12, 35.9% and ages 13 and above, 18% ( $\chi^2=9.6$ ;  $p=0.008$ ). Pregnancy complications ( $\chi^2=11.52$ ;  $p=0.003$ ) and birth injuries ( $\chi^2=10.7$ ;  $p=0.005$ ) were significantly more common in the younger age groups. Delivery complications were more likely to be reported when the fathers' occupation was unskilled ( $\chi^2=8.4$ ;  $p=0.015$ ). In mothers above 40years of age,

obstetrical complications ( $\chi^2=$ ;  $p=0.027$  fishers exact) and delivery complications ( $\chi^2=9.5$ ;  $p=0.011$ fishers exact) were significantly more likely to occur than in younger mothers.

**Mental retardation and obstetrical complications**

Although this was not statistically significant, obstetric complications were more likely to have been reported when the child had a diagnosis of mental retardation ( $\chi^2=3.4$ ;  $p=0.067$ ). However children with mental retardation were significantly more likely to have suffered birth injuries ( $\chi^2=14.05$ ;  $p=0.000$ ).

**Specific diagnostic categories and obstetrical complications**

The six broad diagnostic groups were looked at in relationship to obstetric complications with children with a diagnosis of mental retardation only excluded.

**Table 2: Specific Obstetrical Complications N=112**  
(Information not available for 32 children living in special circumstances)

Obstetrical Complications	N (%)
<b>Pregnancy Complications 19 (17)</b>	
Premature rupture of membranes	6 (5)
Multiple pregnancy	4 (4)
Fever associated with rash in pregnancy	2 (2)
Hypertension in pregnancy	2 (2)
Malaria in Pregnancy	2 (2)
Pre term	1 (1)
Placenta praevia	1 (1)
Abruption placenta	1 (1)
Post term	1 (1)
<b>Delivery Complications 17 (15)</b>	
Caesarean section due to cephalo pelvic disproportion, breech, lacenta praevia, abruption placenta	7 (6)
Prolonged labour	5 (4)
Precipitated labour	2 (2)
Cord round neck	3 (3)
<b>Birth Injuries /complications 13 (12)</b>	
Birth asphyxia	12 (11)
Neonatal jaundice	1 (1)

**Association Between Diagnostic Categories And Obstetric Complications**

OBSTETRIC FACTORS	Diagnostic Categories						p
	Schizophrenia N=12 n (%)	Other psychotic N=35 n (%)	Autistic N=12 n (%)	Disruptive N=14 n (%)	Epilepsy N=16 n (%)	Other disorders N=11 n (%)	
Obstetric complications	2 (16.7)	8 (22.9)	4 (33.3)	6 (42.9)	5 (31.3)	1 (9.1)	p<0.05
Pregnancy complications	1 (8.3)	4 (11.4)	3 (25.0)	5 (35.7)	1 (6.3)	1 (9.1)	
Delivery complications	1 (8.3)	5 (14.3)	2 (16.7)	3 (21.4)	4 (25.0)	"	
Birth injuries	1 (8.3)	3 (8.6)	1 (8.3)	3 (21.4)	2 (12.5)	"	

Excluded from this analysis are (i) children who had a diagnosis of mental retardation only (ii) information about obstetric history not available

Children with disruptive behaviour disorders such as attention deficit hyperactivity disorder, conduct disorder and oppositional defiant disorder had the highest number of obstetric complications (42.9%), followed by autistic disorder (33.3%). The highest number of pregnancy complications was also found among the disruptive behaviour group (35.7%). Delivery complications were commonest among children with epilepsy (25%) while birth injuries highest in the disruptive behaviour group (21.4%). Children with 'other disorders' were had lowest proportions of obstetric complications. However, no statistically significant relationship was found between specific groups and obstetric complications. See table 2.

## Discussion

The aim of this study was to determine the pattern and prevalence of obstetrical complications and relate this to consequent mental health problems in attendees at this child psychiatric clinic. It is however pertinent to briefly discuss interesting socio-demographic characteristics of this sample. The preponderance of boys presenting to this clinic is in keeping with previous research of childhood psychiatric problems were males were more affected.<sup>6</sup> It is of interest to note that majority of the children had Christian backgrounds, fathers who were either professional or semiskilled and mothers who had at least a secondary school education. In a community where equal proportions of Muslims and Christians are reported, and high numbers of unskilled fathers and mothers with none or little education are found, could this presentation pattern be a pointer to problems of accessibility that need to be addressed? Most of the children and adolescents who have presented to this setting have serious and easily recognisable psychiatric disorders such as mental retardation and psychotic disorders that would cause obvious disability and problems with participation in society. Similar patterns of presentation to child and adolescent psychiatric clinics have been observed elsewhere.<sup>6,7,8</sup>

About a third (29%) of children and adolescents attending this clinic had at least one obstetrical complication. Nigeria has one of the world's highest rates of maternal and perinatal mortality and morbidity. Studies suggest that for each case of mortality there are 15 to 20 cases of morbidity.<sup>9</sup> In a review of perinatal deaths in a teaching hospital in Nigeria, perinatal mortality was found in 42.5/1000.<sup>10</sup> More recently in rural Kenya, it was reported to occur in 118/1000 births<sup>11</sup> and among grand-multiparous patients in Nigeria it occurred in 169/1000 deliveries.<sup>12</sup> With these high rates of reported mortality it is hard to imagine the rates of morbidity emerging from these settings.

The types of obstetric complications found in this study are similar to what has been described as common causes of mortality and morbidity in maternity settings

in this environment. Causes of perinatal mortality in a teaching hospital setting within Nigeria included trauma (30.5%), low birth weight (23.9%), haemorrhage (13.7%), toxæmia of pregnancy (10.3%) and congenital malformations (4.3%), while in rural Kenya, haemorrhage, premature rupture of membranes, obstructed labour and mal-presentation were major factors.<sup>11</sup> In a study of 10,515 women presenting to maternity units in West Africa, 1495 (14%) had major complications such as hypertensive disorders, haemorrhage and sepsis.<sup>13</sup> Another study carried out in a Northern Nigerian city found that 4% of women presenting to the maternity unit had obstructed labour, majority due to cephalo-pelvic disproportion.<sup>14</sup> Subsequently studies may want to follow up children who had these pre- and perinatal issues to identify and quantify the mental health implications.

Delivery complications were significantly more common when fathers had unskilled occupations. The association between social class, educational attainment of parents and risk for obstetric complications is established. In a survey of deaths occurring in women in association with pregnancy and childbirth, women with no formal education were found to have a two fold risk of maternal death compared to women with a post secondary education.<sup>15</sup>

A diagnosis of mental retardation was significantly associated with birth asphyxia. In study to investigate and analyse perinatal risk indicators for mental retardation, data concerning perinatal factors possibly related to mental retardation were collected. Independent risk factors identified were asphyxia and other factors such as low maternal social class, multiparity, multiple pregnancy, male sex, low birth weight, hypoglycaemia and hyperbilirubinaemia.<sup>16</sup> These obstetric issues and their attendant complications are very critical for study because of the specific and non-specific effects which may occur in the child.

### *Psychiatric disorders and obstetrical Complications*

No significant difference was found between the various diagnostic categories and obstetric complications. This is not surprising and further substantiates the observed links between several psychiatric disorders and obstetric complications. Boog<sup>17</sup> explains that the risk for schizophrenia is multiplied by two if pregnancy is complicated while Gilbert et al,<sup>18</sup> suggests that birth complications are a non-specific risk factor for persons at risk for schizophrenia. Bersani et al,<sup>19</sup> in a case control study studied the frequency and severity of obstetric complications in 64 schizophrenics using 81 non-schizophrenic brothers as controls. What is suggested is that obstetric complications interact with genetic factors to give rise to mental health problems such as schizophrenia.<sup>17</sup>

The link is not limited to schizophrenia as the risk of

birth complications<sup>20</sup> and a 19 year old longitudinal study of 693 men and women revealed that hypoxic-ischaemic related foetal or neonatal complications could double the risk of developing psychotic disorders.<sup>21</sup> In another study probands with affective disorders had significantly more obstetric complications compared to their siblings without mood disorders.<sup>22</sup> In a follow up study of children with psychotic disorders such as schizoaffective disorder, bipolar disorder, major depressive disorder, psychotic disorder not otherwise specified, obstetric histories did not differ significantly between the groups.<sup>23</sup>

Studies also suggest that obstetric adversity may increase the risk for developing autistic disorder.<sup>24</sup> Since autistic disorder is known to have a strong genetic basis it is suggested that genes may interact with pre and perinatal factors to produce the disorder. Mothers with children diagnosed with autism were found to be more likely to be older and to have experienced obstetric difficulty during pregnancy, labour and delivery.<sup>25</sup>

There are still a lot of unanswered questions on the role of adverse perinatal symptoms in the production of attention deficit hyperactivity disorder (ADHD). Maternal lifestyle factors such as exposure to tobacco smoke are associated with ADHD.<sup>26</sup> Children with epilepsy are also found to suffer increased obstetrical complications<sup>27</sup> and there are also more recent suggestions that prenatal stressors may increase a child's risk for anxiety disorders.<sup>28</sup>

These reveal the importance of good perinatal health in ensuring good mental health. Unfortunately, the key indicators of perinatal health here in Nigeria reflect extremely low standards. Health workers concerned with issues of pre and perinatal health must look beyond mortality rates to the impact of morbidity on the mental health of children, the future generation. There is a sense of urgency to tackle these serious gullies in our health care.

Limitations of this study are that mothers based information on the obstetric history on recollection since there was no access to birth records. Information on birth weight (LBW) could not be utilised, as most mothers had no knowledge of this. The clinical psychiatric categories had few numbers limiting the amount of comparison that could be made. Further study may also want to compare obstetric complications in this child psychiatric clinic population with a sample of children in the general population.

This is however a descriptive study illustrating that obstetric complications are a major contributing factor to mental health problems in children. Many of the complications could have been prevented with better pre and perinatal care. There are also suggestions that certain groups in society may not be utilising health care services as they should, stressing the importance of public health awareness.

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