

Immunization Status of Children with Chronic Neurological Disorders in Enugu, Nigeria

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Abstract

Children with chronic neurological disorders face several issues in common reflecting the chronic nature of the illness, which may put these children at risk of under immunization. To assess the immunization coverage rates of children with CNS seen at University Nigeria Teaching Hospital (UNTH) Enugu. Only 168 children aged 6months-5years who met the selection criteria and attending the Pediatrics Neurology Clinic (subjects) and 171 control that matched for age, sex and socioeconomic status attending the General outpatient clinic were examined. Questionnaires were administered to the mothers. Yates chi-squared and fisher's exact tests were applied at $p < 0.05$, in this study. Immunized children with CNS were 68.5%, while that of the controls were found to be 85.4% at ($P=0.001$). The antigens coverage was significantly better in the controls than the subjects except for BCG and OPV₁ given at birth. The Immunization coverage of children with CNS is significantly lower than normal children in Enugu, Nigeria.

Keywords: Immunization, Chronic neurological disorders(CNS), Paediatric neurology clinic(PNC), Children out patient(CHOP).

1. Introduction

The wide use of vaccines has reduced the incidence of vaccine preventable diseases globally and thus, significantly reduced infant and fewer than 5 mortality rates. It is indeed one of the effective measures in achieving the health related MDGs. These children face several issues in common, reflecting chronicity itself and also aspects of the specific diseases which may alter the health seeking behavior of their caregivers and therefore put these children at risk of non or Under immunization(Call et al.1997). These issues include high cost of medical care which puts a lot of financial burden on families, the inherent stress in providing care for these children, conflicting advises from multiple health care providers and unpredictable response to medication(Witt et al,2003; Hamlett et al,1992; Perrin and Maclean,1988). These factors may lead to erosion of confidence in the health system and hence alters the health seeking behaviours of the care givers of these children who may resort to traditional medicine healers (Izuora, 1988).

The symptoms and signs of neurological disorders manifested by these children may be inappropriately categorized as contraindication to immunization, thereby putting these children at risk of under immunization (Loevinsohn and Gareaballah ,1992; Terva and Taylor,1982). In view of these facts, chronically ill children especially those with CNS whose disability and deformations are more apparent, may have low immunization rates when compared to children without chronic illness. This comparative cross sectional study seeks to assess the immunization coverage rates of these children and the coverage rates of the individual antigens in the National programme on immunization with a view to ascertaining the immunization status of these children with CNS.

1.1 Material and method

This study was carried out in the Paediatric Neurology Clinic (PNC) and children out patient clinic (CHOP) of University of Nigeria Teaching Hospital Enugu (UNTH), between May-December, 2012.

The study population consisted of children aged 6months-five years with CNS attending the PNC (subjects) and those without CNS and chronic Non neurological disorders attending CHOP (controls) whose mothers were able to provide their immunization cards. Both subjects and controls were matched for age, sex and socio-economic class as closely as possible.

Interviewer administered questionnaires were administered to mothers of the subjects and control during clinical presentations at the clinics. Information obtained includes; child's biodata, parental educational status, immunizations received and reasons for incomplete immunization. Confirmation of immunization received was done by examining the immunization cards. Diagnosis of neurological disorders was established by examining the subjects following laid down diagnostic criteria for each disease entity. The controls were also examined to exclude both chronic neurological disorders and chronic non neurological disorders. Socioeconomic index scores were awarded to each child based on the occupation and highest educational attainment of the parents of the child.

Socioeconomic class was calculated as a means of the four parameters and finally these were stratified into upper class (sec 1 and 2 middle class (sec) and lower class (sec 4 and 5). Immunization coverage rates were compared between the subjects and control groups using Yates Corrected chi-squared test and fishers exact probability test for proportion, values of $P \leq 0.05$ were considered significant.

1.1.1 Results

The sociodemographic characteristics of subjects and controls are shown in table 1. The age ranges were 6-55 and 6-58 months for the subjects and controls respectively. The male to female ratios are 1.4:1 and 1.5:1 for subjects and controls respectively. There was no statistically significant difference between the age, sex and socioeconomic status of subjects and controls.

1.1.2 Discussion

This study revealed the Pattern of chronic neurological disorders as seen at the Pediatric neurology clinic of UNTH Enugu and the immunization coverage of children with chronic neurology disorders attending the clinic (fig.1).

In this current study, it was revealed that 115(68.5%) of children with CNS were up to date with their immunizations. This is significantly lower than that observed among the controls 146(85.4%)(tab.2). This finding agrees with the reports of Tervo and Taylor (1982), who concluded that children with severe disability are less likely to be vaccinated. Gindler et al.(1993) reported that they observed that 40% of nurses would not immunize an eligible child with chronic illness. In Ghana Biritwun et al.(2001) noted low immunization rates among children with disabilities. Also in Sierra Leone, Kamara et al.(2006) noted immunization coverage of disabled children was low.

In this study, illness at the time of immunization was the reason for lack of full immunization in 22(41.5%) of children with CNS (tab.4). Only one child in the control group gave illness as the reason for not been fully immunized. Health care workers and mothers may have inappropriately deemed the Childs illness as a contraindication to immunization. Tervo and Taylor,(1982) in Canada noted that health care providers and caregivers were less likely to vaccinate a sick child. Wood et al (1998) and Milteer et al.(1996) working independently observed that the health status of the child influenced child immunization coverage. Thus, the healthier the child the better the immunization coverage.

Analysis in this study pointed out that in 7(13.2%) of the subjects, the fear of adverse reaction was the reason for not fully immunizing their child (tab.4). Amongst health care providers and caregivers, some believe that immunization will worsen the condition of the sick child. Casiday,(2005) reported in a review article on public anxiety over vaccine safety showed clearly that parents are concerned about the safety of the vaccines administered to their children.

Report in this study showed that previous drug reaction such as low grade fever with DPT vaccine and ulcer formation at the site of BCG vaccination was the reason for children with CNS not being fully immunized in 6(11.3%) of the cases(tab.4). Also ignorance of true contraindication to immunization by parents and healthcare givers may have been the reason for the inability of mothers to return for subsequent immunizations in this study. Further investigation showed that children with CNS have lower vaccine coverage for all the vaccines, these differences were statistically significant except for BCG and OPV₀ (tab.3) which were given at birth while still in hospital when the CNS may either not have manifested nor have been noticed by the mother or health workers.

Conclusively, health professionals who see children with CNS need to be aware that they may not be fully immunized. The opportunities to discuss this with parents and care givers or to give immunization should be utilized. Therefore, health caregivers and mothers who are involved in immunization should be properly educated on the true contraindication to immunization. Thus, there is need to sustain regular health education aimed at emphasizing the benefits of immunization and dispelling false concerns about the side effects of immunization.

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TABLE 1:
Socio Demographic Characteristics of Subjects and Controls

Age month	Subjects (%)	Controls (%)	df	χ^2	p-value
6-11	47(28.0)	50(29.2)	4	6.47	0.20
12-23	54(32.1)	43(25.1)			
24-35	22(13.1)	40(23.4)			
36-47	28(16.7)	23(13.5)			
48-59	17(10.1)	15(8.8)			
Total	168	171			
Sex (%)					
Male	97(57.7)	103(60.2)	1	0.23	0.66
Female	71(42.3)	68(39.8)			
Total	168	171			
Socio-economic class (%)					
Upper	54(32.1)	50(29.2)	2	1.22	0.64
Middle	53(31.6)	55(32.2)			
Lower	61(36.3)	66(38.6)			
Total	168	171			

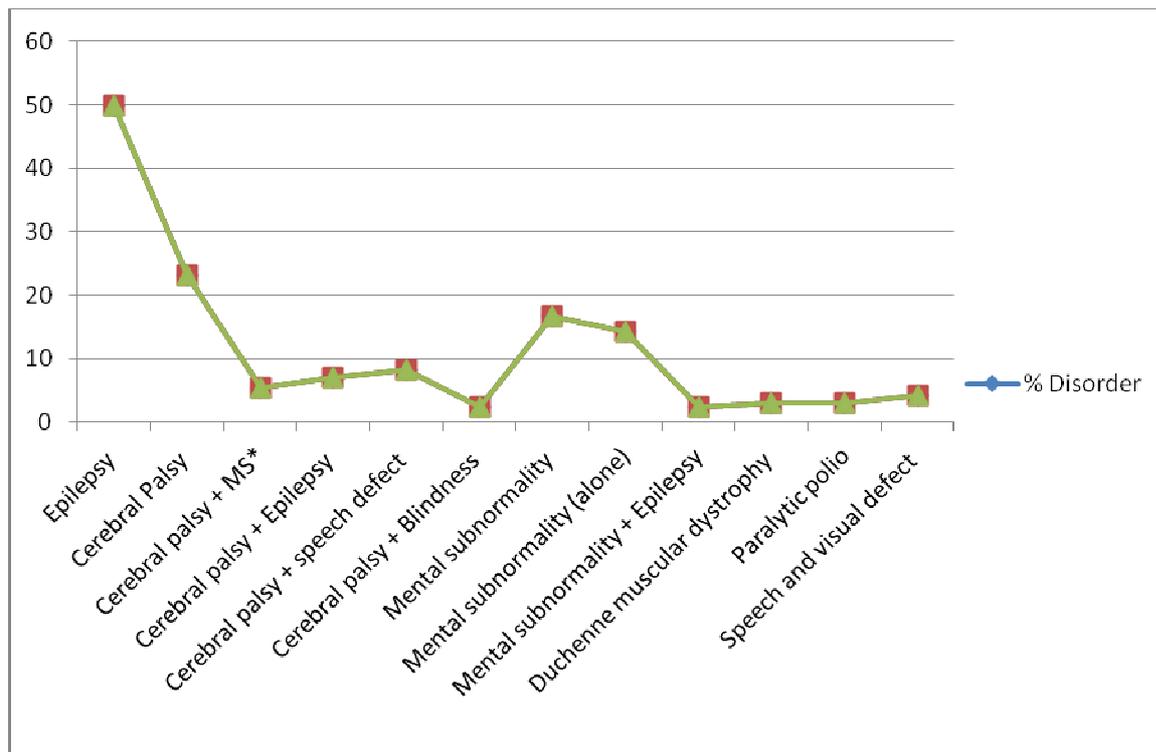


Fig. 1: Pattern of chronic neurological disorders in subjects. *MS-mental sub normality

TABLE 2:
Immunization Coverage Rates of Subjects and Controls

	Subjects	Controls	Total
Fully immunized	115(68.5)	146(85.4)	261
Not fully immunized	53(31.5)	25(14.6)	78
Total	168(100)	171(100)	339

$\chi^2 = 13.26, df = 1, p = 0.001$

Table 3: Individual Vaccines Received by Subjects and Controls

Vaccine	Subjects		Controls		χ^2	p
	Total no Eligible for Immunization	No given n(%)	Total no n	No given n(%)		
BCG	168	164(97.5)	171	170(99.5)	0.85	0.36
OPV ₀	168	164(97.4)	171	169(98.6)	1.89	0.66
OPV ₁	168	152(90.5)	171	167(97.6)	6.64	0.01
OPV ₂	168	145(86.5)	171	165(96.5)	11.10	0.001
OPV ₃	168	140(83.3)	171	162(94.7)	3.77	0.05
DPT ₁	168	144(86.0)	171	159(93.0)	4.72	0.03
DPT ₂	168	142(84.7)	171	159(93.0)	6.09	0.01
DPT ₃	168	142(84.7)	171	157(91.8)	4.33	0.03
Measles	147	119(81.5)	146	131(90.2)	4.50	0.03
HBV ₁	168	114(67.9)	171	158(92.4)	25.47	0.001
HBV ₂	168	104(61.9)	171	141(82.4)	17.9	0.001
HBV ₃	147	87(59.5)	146	117(80.1)	15.2	0.001

Table 4:
Mothers' Reasons For Child Not Having Been Fully Immunized Among Subjects and Controls.

Reasons given	Subjects (%)	Controls(%)	χ^2	df	p
Child illness	22(41.5)	1(4.0)	-	-	0.004*
Fear of adverse					
Reaction	7(13.2)	12(48.0)	9.4	1	0.002
Previous reaction					
to immunization	6(11.3)	4(16.0)	-	-	0.72*
Vaccine not available	6(11.3)	3(12.0)	-	-	1.00*
Other reasons	12(22.7%)	5(20.0%)	0.07	1	0.79
Total	53(100)	25(100)			

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