

Full Length Research Paper

Immunization coverage of antenatal and immunization clinics attendees in the Niger Delta University Teaching Hospital

Adekunle Kunle-Olowu^{1*}, Onyi Euphemia Kunle-Olowu¹ and Ugwu Moses Emeka²

¹Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria.

²Niger Delta University Teaching Hospital, Yenagoa, Bayelsa State, Nigeria.

Accepted 1 November, 2010

The purpose of this study was to determine the coverage for immunization in the first year of life and maternal tetanus toxoid administration in the Niger Delta University Teaching Hospital (NDUTH), Bayelsa State; this will help in establishing ways of improving coverage. A total of 528 were surveyed retrospectively using the immunization register, 521 (98.7%) had BCG, 512(97.0%) had OPV₀, 372 had (70.5%) had OPV₁/DPT₁/HEPBV₁, 313 (59.3%) had OPV₂/DPT₂/HEPBV₂, while only 251(47.5%) had OPV₃/DPT₃/HEPBV₃. Only 94(17.8%) had measles /yellow fever vaccines. However 14.3% of the surveyed children had the complete doses of vaccines. For maternal tetanus toxoid administration, a total of 601 mothers were surveyed using the antenatal and immunization registers. Out of the 601 surveyed, 151(25.2%) and 82(13.6%) had TT1 and TT2 respectively while 368 (61.2%) had both TT1 and TT2 in that pregnancy. The low immunization coverage for children may be detrimental to the attainment of the Millennium Development Goal, aimed at reducing child mortality by 2/3rd in 2015. However the immunization of mothers will contribute effectively to the elimination of neonatal tetanus.

Key words: Immunisation, coverage, teaching, hospital.

INTRODUCTION

Currently, it is estimated that immunization saves the lives of 3 million children per year but 2 million more lives could be saved by existing vaccines, if resources were available to provide universal coverage (Andre, 2003).

Immunization against the six vaccine preventable diseases (diphtheria, pertusis, tetanus, tuberculosis, poliomyelitis and measles) saves the lives of one million children in developing countries each year (World Health Series L, 1986).

Neonatal tetanus is completely preventable by means of two complementary strategies: ensuring hygienic practices during and after delivery and ensuring that women have received sufficient immunizations with tetanus toxoid (TT) to protect their newborns (EPI Update, 1998). Rebecca et al. (1996) reported that immunization is one of the most beneficial and cost

effective health interventions in improving the health of children and women. Administering vaccines takes little time, causes only passing discomfort and requires no special preparation or follow-up in the home.

Tagbo and Onwuasigwe (2005) showed that immunization coverage was on the decline in Nigeria. Substantial resources have been invested in increasing childhood immunization coverage through global initiatives such as Universal Childhood Immunization (UCI) campaign and the Global Alliance on Vaccines and Immunizations (GAVI) (Stephen et al., 2008).

This survey looks at immunization coverage which refers to the percentage of children younger than one year who are fully immunized. The two new vaccines (hepatitis B and yellow fever) that have been incorporated into the Expanded Program of Immunization (EPI) were also considered.

The Niger Delta University Teaching Hospital (NDUTH) came into existence in November 2007. Its present location which serves as a temporary site was a General Hospital that offered mainly curative and some preventive

*Corresponding author. E-mail: olowukunlesnr@yahoo.com.
Tel: 2348033262920.

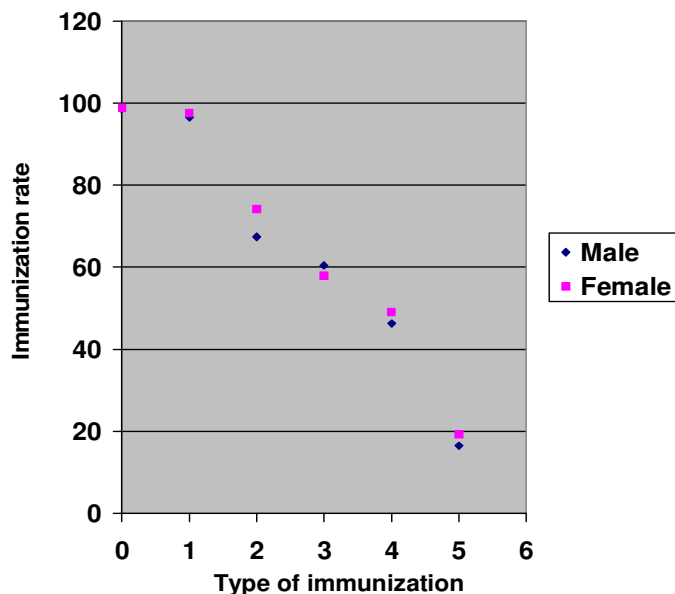


Figure 1. Childhood immunization: Type, frequency and sex. Key: 0 = BCG, 1 = OPV₀, 2 = OPV₁/DPT₁/HBV₁, 3 = OPV₂/DPT₂/HBV₂, 4 = OPV₃/DPT₃/HBV₃, 5 = Measles/Yellow fever.

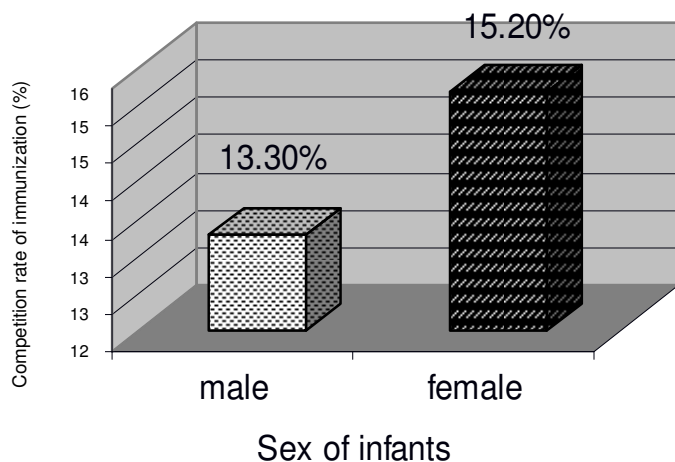


Figure 2. Shows the completion rate of childhood immunization.

services in Paediatrics, Obstetrics and Gynecology, Surgery and Internal Medicine. With the new status, other services in line with a tertiary institution are now being offered. Presently, childhood immunizations are on weekly basis (Wednesdays) while antenatal clinic runs daily and it is hoped that the findings of this survey will form a baseline as well as serve as reference for future studies (Figure 1).

MATERIALS AND METHODS

This was a retrospective study using data collected from the register at the antenatal clinic and infant welfare clinic at NDUTH

(covering a period of 12 months) from January 1st to December 31st 2008. Information obtained included the sex of children and the number/type of the doses of immunizations administered to each child as well as the number of times that tetanus toxoid was given to mothers in index pregnancy.

These data were collected, and analysed using the Statistical Package for Social Studies (SPSS) editor (10th edition). Frequencies distribution for qualitative data and means were generated.

RESULTS

Five hundred and twenty-eight infants (528) and six hundred and one (601) mothers were surveyed. Of the 528 babies, 521 (98.7%) had BCG at birth, 512 (97.0%) had OPV₀. 372 (70.5%) had OPV₁/DPT₁/HBV₁, 313 (59.3%) had OPV₂/DPT₂/HBV₂. 251 (47.5%) had OPV₃/DPT₃/HBV₃ while 94(17.8%) had measles and yellow fever. The mean coverage rate for all vaccines in this study is 65.1%. The distribution of the immunization vis-a-vis sex is shown in Figure 2. There was no significant difference in sex though. Of the completion rate (that is, number of infants who received all doses of the six vaccines) showed that the mean percent was 14.3% with a female predominance: M: F (13.3%: 15.2%).

The influence of nearness of the mothers to the hospital on coverage was also analyzed and is shown in Table 1. It is worthy of note that only 11 (3.4%) of those living far away from the hospital received between 4 to 6 of the 6 doses while 208 (65.0%) of those living closest to the hospital had between 4 to 6 doses. The number of those who received between 1 to 3 doses from both the nearest and farthest place was the same 52 (25.0%). Regarding the maternal tetanus toxoid immunization pattern (Figure 3).

DISCUSSION AND CONCLUSION

The immunization coverage rate for BCG and OPV₀ in this study was 98.7 and 97.0% respectively: these are above the 80.0% national target for 1995. In 2006, the WHO estimate for OPV₃/DPT₃ in Nigeria was 54% while it is even lower in this study, two years later it was 47.5%. The mean coverage rate in 2006 for 193 countries including Nigeria was 74% for DPT3 (Stephen et al., 2008). The mean coverage for all vaccines in this study was 65.1% which is similar to that of a rural community in Edo state (61.9%)^b (Odusanya et al., 2008) and also near to that of the Philippines in 2003 (69%) (Bondy et al., 2009).

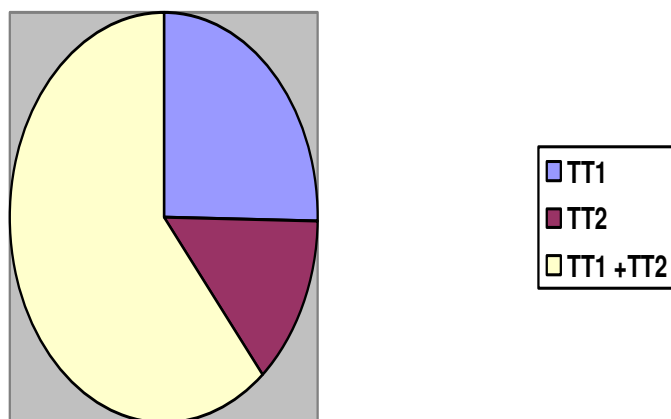
Drop-out rates between first and last doses of 20 to 50% are common in many countries (Tagbo et al., 2005). The drop out rate in this study was 85.7%.

Rebecca et al. (1996) noted coverage data are traditionally considered the best indicators of an immunization programme's performance because they reflect the management of access, and utilization of

Table 1. Association between number of immunization received and nearness to Hospital.

Location (distance to hospital) (Km)	Number of immunizations			
	1 – 3		4 – 6	
	n	%	n	%
Gbarain (0 - 15)	52	25.0	208	65.0
Yenagoa (15 - 44)	104	50.0	101	31.6
Others (> 44)	52	25.0	11	3.4
Total	208	100	320	100

χ^2 3.841 P < 0.05.

**Figure 3.** Maternal tetanus toxoid immunization pattern in index pregnancy.

services. The completion rate of vaccination in this survey is unfortunately very low (14.3%). This could be attributed to the distance of mothers to the hospital and probably the availability of other secondary and primary health care facilities. In a study in Ibadan Nigeria, the commonest reason for incomplete immunization included: non-availability of vaccines (26.2%), not being aware of need for additional doses (16.5%) and inconvenient time/venue (31.7%) (Oladokun et al., 2010). Completion rate in New York City was 74.7% in 2000 and increased to 82.5% in 2006 (Findley et al., 2009); while that of Assam, India was 62.2% in 2008 (Phuken et al., 2008).

Distance from the hospital seemed to be the most important cause of non-completion of immunization as the majority of those who had up to four visits were those closest to the hospital. This calls attention to awareness, dedication and desire to invest in the children well these "big 12" countries (China, India, Nigeria and Pakistan) (EPI database number 3, 2007). The tetanus toxoid immunization status in this study is lower than that of other studies but similar to some findings in Nigeria. A community based survey carried out in Rivers State of elimination of neonatal tetanus requires immunizing women of child-bearing age with minimum of two doses of (while 5 doses provide lifetime protection) tetanus

toxoid (TT) and reduces risk factors for acquiring neonatal tetanus (Weber et al., 2008). Globally, 78% of the developing world estimated 438,000 cases of neonatal tetanus are mustered in 12 large countries, and 52% of estimated cases occur in 4 of Nigeria on tetanus toxoid immunization status of parturient women showed a complete, partial and no coverage status of 41.2, 17.0 and 41.8 respectively of women surveyed (Abuwa et al., 1997). In study at Ile-Ife Nigeria of 896 mothers, 668 (74.6%) claimed they received TT during pregnancy but was conformed in 37(4.1%) (Owa et al., 1992). In 2001, the Lao People's Republic reported 62.7% for TT1 and 47.2% for TT2 (WHO's Weekly Epidemiological Report, 2002). A community-based survey in Namibia equally reported a much higher coverage; 67% for TT1 and 90% for TT2 (WHO's Weekly Epidemiological Report, 2002). The present study has shown that the coverage rate for the first two doses of routine EPI vaccines is high in NDUTH, the completion rate is very poor and that distance from the hospital was a major factor in causing drop-out. It is not known if dropouts who live far from the hospital continued their child's immunization at nearer health facilities. In view of the above, we recommend the following:

- (i) Mothers should be given more awareness about the importance of immunization during each antenatal visit and
- (ii) children whose mothers live far from the hospital should be referred to nearer health facilities (and followed up) to ensure completion of vaccination.

REFERENCES

- Andre FE (2003). Vaccinology: past achievements, present roadblocks and future promises. *Vaccines*, 21: 593-595.
- Assessment of incidence of Neonatal tetanus in selected districts in the Lao People's Democratic Republic (2002). WHO's Weekly Epidemiological Record, 33(77): 277-280.
- Assessment of neonatal tetanus elimination, Namibia (2002). WHO's Weekly Epidemiological Report, 15 (77): 121-124.
- Bondy JN Bondy JN, Thind A, Koval JJ, Speechley KN (2009) Identifying the determinants of childhood immunization in the Philippines. *Vaccine*, 27(1): 169-175.
- Expanded Programme on Immunisation (1998). Neonatal Tetanus: Immunize all Women of Childbearing Age. Update. Geneva: WHO.

- Findley SE, Irigoyen M, Stockwell MS, Chen S (2009). Changes in childhood immunization disparities between central cities and their respective states, 2000 versus 2006. *J. Urban Health*, 86(2): 183–195.
- Lim SS, Stein DB, Charrow A, Murray CJL (2008). Tracking progress towards universal childhood immunization and the impact on global initiatives. *The lancet.*, 9655(372): 2031–46. www.who.int/immunizations. Accessed 19/08/2009.
- Odusanya OO, Alufohai EF, Meurice FP, Ahonkhai VI (2008). Determinants of vaccination coverage in rural Nigeria. *BMC Public Health*, 5(8): 381.
- Phuken RK Barman MP, Mahanta J (2008). Factors associated with immunization coverage of children in Assam, India: Over the first year of life. *J. Trop. Paediatr.*, (Provide page number please).
- Population Reports (1986). *Issues on World Health, Series L. Number 5*, J. H. U. Maryland.
- Rebecca F, Kathryn P, Alberti PA, Lisa AK, Maria-Eve B (1996). Delivering Quality immunization Services. *BASICS Q. Newslett.*, 3(1): 3.
- Tagbo BN, Onwuasigwe C (2005). Missed Immunization Opportunities among Children in Enugu: Niger. *J. Paediatr.*, 32(4): 73-76.
- Vaccine and Immunization News (2007). From the Expanded Programme on Immunization (EPI) database. Number 3.
- Weber DJ, Gust D, Weintraub D, Kennedy A, Soud F (2008). Benefits of Immunisation. *Adv. Vaccinol.*, 2(3): 18-20.