

## The effect of crude oil exploration on growth and peak expiratory flow rate of children

A.O. NAIHO<sup>1</sup>, L.E. EBITE<sup>2</sup>, C.P. ALOAMAKA<sup>1</sup> and K.E. NWANGWA<sup>1</sup>

<sup>1</sup>Department of Physiology, <sup>2</sup>Department of Anatomy,  
Delta State University Abraka (Nigeria).

(Received: February 05, 2009; Accepted: April 20, 2009)

### ABSTRACT

The effect of crude oil exploration on the growth of children and their peak expiratory floor rate was investigated. The weight, height and expiratory flow rates of a 100 male and a 100 female children between the ages of 5 and 10 years, in an oil producing community and a non oil producing community in Delta State of Nigeria were measured. Data was analysed using Z-test statistics. Results show significant ( $P < 0.05$ ) Reduction weight, height, BMI and peak expiratory flow rates of children in oil producing community compared to their counterparts in the non oil producing community.

**Key words:** Crude oil, growth and peak, children.

### INTRODUCTION

Industrialization through exploitation of crude oil has introduced into the ecosystem substances that are potentially toxic to life and environment (Dede and Kogbo 2002) These toxic substances tend to disturb the delicate ecological balance. In Nigeria the exposure of crude oil in the aquatic environment in son the increase following several frequent spillage this becomes more interesting when we know that these polluted streams and rivers more often than not are the only source of drinking water to neighbouring communities. Several effects of crude oil in experimental animals have been documented i.e negative effect of diesel on male reproductive function. Seiichi and Ken (2004). Hematotoxicity as a result of ingestion of shellfish exposed to crude oil polluted water (Eyong 2005). Also high rates of child malnutrition and mortality, increase in defects and rashes have been reported in areas impacted by oil development (Kimberling 1991). This work therefore attempts to find out the impact of crude

oil on the growth of children in our local oil producing communities and also the impact of curde oil on the peak respiratory flow rate of thes children.

### Methodology

#### Materials

100 males and 100 female subjects between 5-10years were randomly selected from two location, an oil producing community and a non-oil producing community and a non-oil producing community in Delta State Nigeria.

The locations were selected using cluster sampling. Height was measured using bathroom scale (120kg capacity). And peak expiratory flow rate was measured using an analog hand held peak flow meter. Body mass index was calculated using the formular

$$\text{BMI} = \frac{\text{weight (kg)}}{\text{metre}^2 (m^2)}$$

Data was analysed using Z-test statistics

## RESULTS AND DISCUSSION

Our results show statistically significant reduction ( $P < 0.07$ ) in weight and BMI of children in oil producing community. There was also a statistically significant reduction in peak flow rate of children in oil producing community compared to children of the same age in the non-oil producing community. There was however no statistically significant difference ( $P > 0.05$ ) in high of children in both communities. This reduction in BMI and weight is indicative of reduced growth in children who live in oil producing communities, especially as is the case in the Niger Delta where the polluted stream forms the major sources of drinking water and survival is from fishing as subsistence farming where produces are also affected by crude oil

pollution. This is in agreement with a report by the national resources by National resources Defense Council, which reported high rates of child malnutrition and mortality, increase birth defect and rashes in areas impacted by oil development (Kimerling 1991). The poor growth performance of plauts in crude oil impacted ares have be reported have been described (Akpofure 2000) the study suggested growth performance of crops in terms of plant height, colour, girth, leaf area, heat number, and dry weight were adversely affected by crude oil. It is therefore not surprising that children who depend on these plants for nutrient will also be adversely affected.

We also observed a statistically significant ( $P < 0.001$ ) reduction in peak flow rate of children in

Community	Oil producing	Non oil producing	Z- value	P-value	Remarks
Weight (kg)	19.65±1.4	26.2±2.6	16.3	P<0.001	S
Height (m)	1.73±0.37	1.178±0.13	1.25	P>0.05	NS
BMI kg/m <sup>2</sup>	15.31±0.63	18.89±1.9	17.98	P<0.001	S
PFR ml/min	130.3±12.8	138.3±6.6	5.55	P<0.01	S

oil producing community. Since crude oil in lipophilic it could easily accumulate in tissues due to it's high lipid solubility and became difficult to excrete. Accumulation of inhaled hydrocarbons and smoke will thus be difficult to remove by the mucocilliary staircase mechanism hence cause irritation and excess secretion of mucus which will increase airway resistance and reduce peak flow rate. This is in concordance with which reported that inhalation (Szaut et al 2003) of aromatic hydrocarbon may cause respiratory tract irritation.

We therefore report that crude oil pollution

in oil producing communities in Delta State Nigeria may impacts negatively on the growth and respiration of children in this affected communities. And we appeal that policies be put in place to stop gas flaring immediately, create proactive measures to reduce oil spillage to its bearest minimum, and institute the usage of different remediation technique to reduce contamination of the polluted environment.

### NB

Names of communities have not been mentioned for security reasons.

## REFERENCES

1. Akpofure E.A., Efere M.L. and Ayowei P. Oil spillage in Nigeria's Niger Delta; Psychomorphological on empirical overview (2000).
2. Dede E.B. and Kagbo H.D., A study on the acute toxicological effects of commercial diesel fuel in rats using Hematological parameters. *Journal of Applied science and environmental management* 6(84-86) (2002).
3. Kimberling J., Amazon Crude oil. National Resources Defense Council (1991).
4. Eyoung E.U., Hemotoxic Effects following ingestion of Nigeria crude oil pollutes shellfish by rats. *Nigerian Journal of Physiological Sciences*. 19(1-2): 1-6 (2005).
5. Seiichi Y., and Ken T., The effect of Diesel Exhaust on marine male reproductive function. *Journal of Health Sciences*. 50(3): 210-214 (2004).
6. Szaro et al (2003).