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Probable Transient Anterior Bulging Fontanelle after Measles Vaccination: A Case in Arba Minch General Hospital, Southwestern Ethiopia

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ABSTRACT

Transient anterior bulging fontanelle is a rare but serious medical condition, which can be classified as definite and probable transient bulging fontanelle. Conducting case surveillance, diagnosis and on time reporting during vaccination is of paramount importance in managing the adverse events following immunization. We diagnosed probable transient bulging fontanelle in a 9 month infant weighing 7.8Kg with ultrasound in Arba Minch General Hospital after 12 hours of measles vaccination. A physical examination was conducted to confirm probable transient bulging fontanel. Treated with her mother's breast milk at her home and visiting was done after three and five days. We used a measles vaccine adverse effect case report, to find potential transient bulging fontanelle (TBF) and to describe the characteristics of probable cases of TBF on admitted infant to Arba Minch General Hospital. The Infant was alert; a febrile to touch whose temperature measured at the left auxiliarysitewas37.8oc with non-tender, bulging and tense swelling that includes non-pulsatile anterior fontanelle size of 3cm.The infant was found with no fever, vomiting, bleeding and no problem of feeding and respiratory difficulties except a history of fallen down accident from bed on her head 15 days back of the swelling. The swelling was decreased gradually and the fontanel started pulsation and the swelling returned back to the normal after the three and five day of visits without any medication. Despite this rare side effect, vaccination against the preventable disease, measles need to be sustained since transient bulging fontanelle is a self-limited case and immunization balances the impact of adverse events following immunization. Adequate case surveillance, diagnosis and reporting are very essential up to the management.

Keywords: Anterior fontanelle; Bulging; Immunization; Infant; Measles

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Introduction:

Fontanelles are “the spaces between the bones that remain open in babies and young children” (D’Antoni et al., 2017).Anterior fontanelle is the largest, prominent and most important fontanelle, which is used for clinical evaluation different medical disorders (Oumer et al., 2018).At birth, anterior fontanelle has an average size of 2.1 cm but tends to decrease as the age of neonates increases (Esmaeili et al., 2015; Kiesler and Ricer, 2003). Bulging anterior fontanelle in infancy is a sign of raised intracranial pressure (Raju and Chacko, 2014). It has several causes including central nervous system infections, hydrocephalus, space-occupying lesions, pseudoumor cerebri syndrome (Goldberg, 2013), *osteogenesis* imperfecta, *achondroplasia*, hypothyroidism, rickets, Down’s syndrome (Kiesler and Ricer, 2003), or other skeletal or growth-related anomalies, *cephalohematoma,* encephalocele, lymphangioma, dermoid and sebaceous cysts (Freedman et al., 2005). If an infant’s bulging fontanelle resolved promptly and spontaneously, it is known as ‘‘transient bulging fontanelle while ‘definite transient bulging fontanelle’ is defined as bulging fontanelle with normal neuroimaging and cerebrospinal fluid analysis, and absence of depressed level of consciousness, focal neurologic findings or identified cause. ‘Probable transient bulging fontanelle’ lacks either lumbar puncture or neuroimaging or both but meets all other criteria (Freedman et al., 2005; Fernandez-Pol et al., 2016).To prevent and even eradicate vaccine preventable infectious diseases, WHO established expanded program on immunization (EPI) which has a goal to make vaccines available to all children through-out the world despite a particular attention is given for vulnerable populations (Örtqvist et al., 2010). The first dose of measles vaccination is one kinds of evidence based tools protecting children between the age of 9 and 15 months against measles disease, which can result in death and severe debilitation (Maglione et al., 2014). Despite vaccine safety is being assured, mild to transient adverse effects has been occasionally reported following immunization. Adverse effects following diphtheria tetanus (DT) and diphtheria-pertussis-tetanus vaccine administration and measles vaccination has been documented sporadically in India and Chicago(Freedman et al., 2005), but there is no published report in Ethiopian infants.

Case report

A 9-month-old female infant weighing 7.8Kg referred to Arba Minch General Hospital, Southern Ethiopia with fontanel swelling of one day duration. She had no fever, vomiting and bleeding. She had no problem of feeding and respiratory difficulties. Furthermore, she had no history of forceful and violent shaking, seizure, medications, encephalopathy, meningitis, subdural and retinal hemorrhages; but she has a history of fallen down accident from bed on her head 15 days back of the swelling; and had no any history of laceration, neurological impairment and systemic pertinent findings. The infant was administered measles vaccine 12 hours prior to onset of the swelling. On physical examination, she was alert; a febrile to touch whose temperature measured at the left auxiliarysitewas37.8^{o}c.She had no weight loss and was not irritable. The swelling was non tender, bulging; tense and non-pulsatile at the anterior fontanelle measuring about 3 cm. Ultrasound examinations was undertaken and anterior fontanelle (AF) size confirmed was 3cm on the infant and no treatment had given. The mother advised to give breast milk and sent home. After three days of visit, the swelling was decreased gradually and the fontanel started pulsation; then, the swelling returned back to the normal after five days without any medication. In this case study, the infant merely came with bulging of the anterior fontanel after measles vaccine was administered to her. Therefore, we associated the cause of the swelling as adverse effect of measles vaccination and diagnosed as probable anterior bulging fontanelle secondary

to measles vaccine administration. It is "probable" because neuro-imaging and lumbar puncture was undone.

Figure 1: The child Admitted with anterior bulging fontanelle

Discussion:

A unique feature in this infant with TBF shortly after measles vaccinations is absence of any clinical presentation related with the cases presented. Several published reports listed vaccinations among causes of bulging fontanelle. TBF was reported by Freedman et al., (2005), but there was fever, vomiting, the interval from vaccination to symptom onset was18 hours, and time to resolution was 3 days; but in our case there was no fever and vomiting; the time interval from vaccination up to onset of swelling was 12 hours and was not confirmed by imaging studies (Computerized Tomography scan and Magnetic Resonance Imaging but with ultrasound). Moreover, in our case, the infant was followed for five days since she recovers within five days but took from 2 month up to 5.5 years of follow up in the above literature. The case was reported in India with the same age (but different sex) and approximately the same weight (6.4 Kg),but presented with fever and three episodes of vomiting who was administered measles vaccine 10 hours prior to onset of fever; on examination, the anterior fontanelle was pulsatile; systemic examination, Lumbar puncture and MRI revealed normal in which ceftriaxone was started empirically (Raju and Chacko, 2014).We did not evaluate an Infant with abnormal neuro-imaging or an alternative cause. Also, TBF was reported in Washington DC by *Fernandez-Pol* et al., (2016) in a 7 month old boy after full vaccination, but it was associated emesis, vomiting, fever, decreased movement, his mother had a history of inactive herpes simplex virus (HSV) infection treated with acyclovir before and during delivery; his plasma DNA PCR for human herpesvirus-6 (HHV-6) was positive, which was confirmed that the patient had transient intracranial hypertension. Bulging anterior fontanelle was also reported by Tu et al., (2005) in 18 febrile and 27 non-febrile infants with clinically significant abnormal findings.

Conclusion

From this case study, we assumed that children might develop a self-limited transient bulging fontanelle after measles vaccination, occasionally. TBF may present in infants with different manifestations (febrile and a febrile, both those who have vomiting or not). Therefore, conducting regular surveillance, identification and on time reporting of mild to severe adverse events following vaccination plays a significant role for proper case management. Moreover, despite such adverse effects, immunization need to be placed much higher on the agendas of the ministries of health and other organizations which are capable of effective action for prevention of vaccine preventable diseases. Confirmation of

a relationship between vaccinations and TBF may be important to long term management of infants with development of bulging fontanelles shortly after immunizations with close observation of children. Researches and reports on TBF incidence rate in Ethiopian, even in all African countries and estimation of whether or to what extent vaccination may affect the risk is limited to non-reporting rate and require a systematic analysis.

Other Information

Human subjects: Consent was obtained by all participants in this study.

All authors have equal contributions.

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