ANIL AGGRAWAL'S
Internet Journal of Forensic Medicine and Toxicology
The world's first online journal devoted entirely to forensic medicine and toxicology · Published 1 January and 1 July

VOL. 6, NO. 2 · JULY – DECEMBER 2005
Downloaded from www.anilaggrawal.com · ISSN 0972-8074 (Online) · https://www.anilaggrawal.com/ij/vol_006_no_002/papers/paper004.html

Crude Oil Poisoning in a 2 Year Old Nigerian - A Case Report

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CITE THIS ARTICLE

Otaigbe BE, Adesina AF. Crude Oil Poisoning in a 2 Year Old Nigerian - A Case Report. *Anil Aggrawal's Internet Journal of Forensic Medicine and Toxicology* [serial online], 2005; Vol. 6, No. 2 (July – December 2005): []. Available from: https://www.anilaggrawal.com/ij/vol_006_no_002/papers/paper004.html

Background

Traditional home remedies are still commonly used in childhood convulsions in Nigeria, and the administered remedy depends on the practices of the community. In most cases the parents are not directly involved in the convulsive episode due to panic and confusion[1].Various home remedies include human and cow urine, kerosene, fuel and crude oil with sequel of chemical pneumonitis and central nervous system involvements[2,3].

Aim

To highlight the danger associated with using crude oil to treat febrile convulsions at home.

Materials and methods

We present a case of shock, acute renal failure, mechanical intestinal obstruction, extensive epidermolysis, conjunctivitis, mucositis, oesophagitis and chemical pneumonitis in a 2 year old following ingestion and dermal application of crude oil for treatment of childhood convulsion.

Conclusion

We advocate mass enlightenment campaigns and more active advocacy on the part of paediatricians against the use of harmful traditional remedies including crude oil to treat febrile convulsions at home.

Keywords

Convulsion, Crude Oil, Poisoning, Child, Complications

Introduction

Convulsion is one of the commonest reasons for consultation in most Paediatric Emergency Units[4,5]. In Nigeria, as in most other developing countries, children are subjected to unorthodox treatment as first aid therapy in emergency conditions at home[3,6,7,8].Though the expected benefits of medical intervention should outweigh the possible harm, parents and guardians occasionally adopt some interventions which are futile, harmful and with no pathophysiologic rationale[3,6,7]. The use of crude oil as a remedy for convulsion has been documented[1,2,3]. Emanating from an oil producing area of Nigeria, these reports probably highlight ethnocentric medicine[3]. The documented side effects of crude oil include chemical pneumonitis[2]and CNS complications[3]. We present a case of crude oil poisoning in a 2 year old following ingestion and dermal application of crude oil for treatment of a febrile convulsion with sequel of shock, acute renal failure, mechanical intestinal obstruction, extensive epidermolysis, conjunctivitis, mucositis, oesophagitis and chemical pneumonitis.



Figure 1. Case showing generalized erythema with abdominal distension on day 1

Case Report

IC, a 2 year old female child, was rushed into the children's emergency room in shock, with a history of bowel motions of greater than 5 times daily, vomiting of more than 3 times daily, high grade fever, all of five days duration and a one day history of convulsions. She had two episodes of convulsion, each lasting about 20 minutes for which she was treated with crude oil provided by a

neighbor. Crude oil was applied all over the skin, forced down the child's throat, into the ears and instilled in the eyes. Bowel motions and vomiting are said to have increased after ingestion of crude oil. She was brought to the hospital because she was restless and not responding to calls. On examination, she was found to be in shock and was resuscitated with intravenous Ringers lactate. She weighed 8.5 kg. The abdomen was distended with absent bowel sounds. Twelve hours later she was noticed to have generalized erythema (fig 1), with progressive redness, desquamation and extensive epidermolysis by day 4 (fig 2). Bilateral fine crepitations, conjunctivitis, multiple ulcers with slough on buccal mucosa and tongue with angular stomatitis were noticed by Day 2 and managed accordingly. The abdominal gait continued to increase with no bowel motions but hyperactive bowel sounds on day 3. An urgent abdominal X-ray showed dilated bowel loops, multiple air fluid levels, ground glass appearance in the pelvic region and absence of rectal gas. Distension resolved after 72 hours with conservative management. Last urine output was 12 hours after presentation and of small volume. An urgent Kidney function tests revealed acidosis and hyperkalaemia which were corrected. She made 550 mls of urine after a fluid challenge and the volume of urine increased gradually thereafter. She was transfused on the 6^{th} day for anaemia of 6g/dl. Fever did not subside on intravenous ampicillin which was then changed to Cephthriazone. She developed dysphagia with vomiting of all semi -solid feeds by the 10^{th} day after Nasogastric tube was removed and was managed for oesophagitis. Within 2 weeks, she lost 2.8 kg (33% of her admission weight) with marked loss of subcutaneous fat, hanging skins and prominent bones. She was discharged after 2 months of admission in fairly stable state. Samples of the crude oil could not be obtained for toxicologic analysis because parents were afraid to implicate the neighbor, a naval officer's wife, who provided it.



Figure 2. Same patient (as in figure 1) with desquamation, extensive epidermolysis and weight loss

Discussion

Febrile seizures which carry a good prognosis around the world are associated with a high mortality and morbidity in Africa[9,10]. This has been attributed to the administration of some indigenous concoctions before the children are brought to hospital[1,2,3]. In Nigeria, the traditional concoctions used in the treatment of convulsion vary with cultural practices[2]. Crude oil is predominantly found in the riverine areas of Nigeria[11].With oil exploration in the Niger Delta of the country, it is obtained from oil fields by workers and distributed or sold for treatment of several ailments such as convulsion[3], gastrointestinal disorders, burns, foot ulcers, poisoning and witchcraft[11]. Oil bunkerers and armed forces personnel who have access to crude are also involved in this practice. Crude oil is not a specific mineral substance and though often called petroleum hydrocarbon it sometimes contains other elements[12]. It can be divided into heavy and light. Though the sample used on this child could not be analyzed, crude oil found in Nigeria is the Bonny Light crude oil with a specific gravity of 0.8 and containing virtually no other elements than carbon and hydrogen. It is distilled at below 270^{o}C.[11]

Crude oil poisoning in humans has been discussed in the context of accidental intoxication[13]. The toxic effects of petroleum hydrocarbon are exerted on a variety of organs of living systems such as the lungs, liver and kidney[14,15]. Controlled exposures in man have demonstrated a range of effects. The effects on dermal exposure include a burning sensation, irritation, erythema, followed by the formation of vesicles, blisters and even extensive epidermolysis[15]. Coughing, choking and gagging have been noted on ingestion and if respiratory signs and symptoms appear early it indicates that aspiration has taken place[16]. The risk of aspiration and thus chemical pneumonitis was high in this patient since crude oil was forced down her throat during convulsive episodes. Crude oil is also volatile and therefore easily aspirated into the lungs causing chemical pneumonitis[2]. Nausea, vomiting and diarrhoea may occur and stools may be blood stained[16]. This may account for the increased frequency of diarrhoea and vomiting with resultant shock noticed in our patient.

Central nervous system symptoms may develop such as lethargy, convulsion, coma and death and with smaller doses, the symptoms include vertigo and headache[16]. It is therefore ironic that a substance which can itself cause convulsion and coma is used ignorantly in the treatment of convulsion.

Crisp et al described acute renal failure with oliguria in 3 patients. However in 2 cases, absorption seems to have been mainly through the skin[17].

The severe effect of the crude oil used in this child could be because it was unrefined and likely to be more toxic than the petroleum solvents and distillates used in controlled studies[16,17].

This report highlights the risk of using crude oil in the unorthodox treatment of convulsion and emphasizes that it is a form of child abuse. Though not enforced, the Federal Government of Nigeria promulgated a Children's decree in 1973, in which infliction of injuries on a minor is a criminal offence.[18] Parents, caregivers, guardians and communities should be sensitized about the harmful effect of this practice which should be discouraged. Paediatricians should be more active as advocates to protect our children from harm through such obnoxious forms of unorthodox treatment for convulsion and should encourage enlightenment campaigns in schools, churches and markets on the ways to handle fever and convulsions at home before bringing the child to hospital.

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