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CASE REPORTS

Poisoning due toYam Flour Consumption in Five Families in Ilorin, Central Nigeria

Intoxication due à la consommation de farine d'igname parmi les cinq familles à Ilorin, le centre du Nigéria

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ABSTRACT

BACKGROUND: Food poisoning is known to occur sporadically from time to time due to poor hygienic preparation. Its occurrence rarely assumes epidemic proportion.

OBJECTIVE:To report the ecurrence of food poisoning due to yam flour consumption among five families and to create public awareness about the condition.

CASE REPORT: Food poisoning due to yam flour consumption which occurred almost in quick succession between February and July 2005 among five family clusters in Ilorin is reported. They presented variedly with diarrhoea, vomiting, abdominal pain, convulsion and loss of consciousness. They all recovered within 48 hours of admission. Even though we could not carry out toxicological tests, yam flour consumption was highly implicated as the cause. Investigations indicated that the use of certain lethal preservatives for the processing of the yam flour might be responsible.

CONCLUSION: Poisoning from consumption of yam flour should be a differential diagnosis of acute seizure disorder or the occurrence of vomiting, diarrhoea and abdominal pain in the tropics. We recommend education on proper processing of all food products in view of the public health implication of doing otherwise. WAJM 2008; 27(1): 41–43.

Key words: Poisoning; Yam flour; Families; Ilorin

RESUME

CONTEXTE: L'intoxication alimentaire est appelée à se produire sporadiquement, de temps à autre en raison de la mauvaise hygiène de préparation. Son accident est rarement assume proportion épidémique.

OBJECTIF: rapport de la survenance d'une intoxication alimentaire due à la consommation de farine d'igname parmi les cinq familles et de sensibiliser le public sur la condition.

CASE REPORT: intoxication alimentaire due à la consommation de farine d'igname qui s'est produit presque en succession rapide, entre février et juillet 2005 auprès de cinq grappes à Ilorin famille est signalée. Variedly Ils ont présenté une diarrhée, des vomissements, des douleurs abdominales, des convulsions et une perte de conscience. Ils sont tous retrouvés dans les 48 heures suivant l'admission. Même si nous n'avons pas pu procéder à des tests toxicologiques, la consommation de farine d'igname a été très impliqué dans la cause. Les enquêtes ont indiqué que l'utilisation de certains agents conservateurs létale pour le traitement de la farine d'igname pourrait être responsable.

CONCLUSION: Intoxication à la consommation de la farine d'igname doit être un diagnostic différentiel de troubles aigus de saisie ou de la survenue de vomissements, diarrhée et douleurs abdominales dans les tropiques. Nous recommandons l'éducation sur le traitement adéquat de tous les produits alimentaires en vue de la santé publique implique de faire autrement. WAJM 2008; 27(1): 41–43.

Mots clés: Intoxication; farine; famille; Ilorin.

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Abbreviations: ORS, oral rehydration solution.

INTRODUCTION

Food poisoning is known to occur sporadically from time to time due to poor hygienic preparation. Food poisoning could be due to either biological or chemical causes. Its occurrence does not usually assume epidemic level. However in 2005, the occurrence of food poisoning due to yam flour consumption among family clusters created public concern in Ilorin and its environs. Yam flour remains a common staple in this environment. It is obtained from the processing of yam which is the edible tubers of Dioscorea *spp.* [1] It is consumed by millions of people in West Africa and parts of East and Central Africa.[1] Nigeria alone produces about 30 million tonnes of yam (64% of total world production) annually making it the world's largest producer of yam.[2] It contains mainly starch with little amount of proteins, lipids and vitamins.[3] The local people usually process some of the harvested yams into yam flour for family consumption and marketing in neighbouring cities and villages. This article will report cases of food poisoning due to yam flour consumption, which occurred almost in quick successions between February and July 2005 among 5 family clusters in Ilorin, the capital of Kwara State, Nigeria. All the families reside in Ilorin and obtained the controversial yam flour from markets within the city.

Case Reports

Family 1

Three siblings aged 4, 6 and 9 years presented in the Emergency Paediatric Unit of the Hospital sometime in February 2005, with history of three episodes of diarrhoea, two episodes of vomiting and periumbilical pain of 20 minutes duration. All the symptoms commenced about twenty minutes after a meal of yam flour with 'ewedu' sauce prepared by the mother. Two other siblings who were not brought to the hospital for admission also had vomiting and abdominal pain, but no diarrhoea. The mother did not develop any symptom. The three children were not dehydrated and did well with ORS and symptoms resolved within 6 hours and they were all discharged within 24 hours of admission. In all, five members of the family were affected. They all remained stable at follow-up.

Family 2

Three months after the above presentations, in early May 2005, another 8-year-old child presented with 2 episodes of vomiting and four episodes of multiple generalised tonic clonic convulsion of three hours duration following a meal of yam flour and 'melon' sauce taken about two and half hours earlier prepared by the mother. He is not a known seizure disorder patient and there was no fever. Other family members took the same food, but only one sibling developed vomiting. Examination revealed generalized tonic-clonic convulsion and altered state of consciousness (Glasgow Coma Score-6). Paraldehyde and phenobarbitone were administered and parenteral bolus dextrose was also given. She became fully conscious within 24 hours. The Cerebropinal fluid microscopy, culture and sensitivity, protein and sugar were normal. The other siblings in the family were admitted for observation. They were all stable within 48hours of admission and subsequently discharged. They remained stable at follow-up.

Families 3 and 4

Two weeks after the above second episode, in May 2005, two different families presented again. In the first family, a 6-year-old male child developed four bouts of diarrhoea within an hour following ingestion of yam flour with 'okro' sauce. There was no vomiting. The parents were also on admission at the adult emergency section of the Hospital for diarrhoea and vomiting. The boy was restless and severely dehydrated on examination but did not convulse. He was given parenteral fluid and the symptoms resolved within some hours of admission and were discharged home the next day. The second family comprising of six family members including four children presented four hours after the first family was admitted. They also presented with diarrhoea and vomiting following ingestion of yam flour with 'melon' sauce. The entire family was affected. They were all mildly dehydrated and were commenced on parenteral fluid. The symptoms resolved and they were all discharged the next day. They all remained stable at follow-up.

Family 5

Three children aged three, four and ten years of the same parent and living in the same household developed generalized tonic clonic convulsion about three hours after a meal of yam flour with 'okro' sauce in July 2005. The yam flour was bought at a popular market in Ilorin. There was no neck stiffness. No vomiting except for one of them in whom vomiting was induced with palm oil. Cerebro spinal fluid, microscopy culture and sensitivity, protein and sugar were normal. Each of them had between one to four episodes of generalized seizures. There was no post ictal loss of consciousness. The seizures abated with paraldehyde and phenobarbitone and were all discharged the next day. At follow up, they remained stable.

The table surmmarises the data of all the cases.

Table1: Clinical Presentation and Outcome in the Five Families

Family	Month 2005	Total Number Affected (Children)	Hours Hospitalised	Symptoms	Sauce
1	02	5(5)	24	Vomiting Abd. pain Diarrhoea	*Ewedu*
2	05	2(2)	48	Vomiting Seizures	Melon
3	05	3(1)	24	Vomiting Diarrhoea Dehydration Restlessness	*Okro*
4	05	6(4)	24	Vomiting Diarrhoea	*Okro*
5	07	3(3)	24	Seizures	Melon

DISCUSSION

Yam flour is a staple food in most parts of Nigeria. Yam storage before processing to yam flour is an elaborate process involving the yam chips been preserved with pesticides such as aldrin and phosphine. Gammalin 20 which is an example of aldrin is commonly used by farmers. Depending on the level added, it could be lethal since it stays on the yam chips. It is also heat resistant and so it sticks to the food for a long time despite boiling at very high temperature. Phosphine tablet is also used. It releases phosphine gas to kill the pests. This is carried out in an airtight condition. After they are exposed, yam flour from those yam chips should not be eaten for the next three months so that the effect of the phosphine gas can wear out. The residues formed by the phosphine tablet are toxic, easily mixes with the yam flour and is lethal to consumers. It is suspected that the processing of this flour consumed by the affected patients was not painstaking as there might have been some rush to consume or sell some of this flour to get money. Yam flour consumption was a common and consistent preceding event in all the patients highlighted in the case reports. The sauce with which they took the yam flour is unlikely to be the cause of the food poisoning as the patients took varied sauces.

Stored yam chips generate osmotic pressure under the warm and humid tropical climate of Southern Nigeria and some parts of the middle belt and absorb moisture from the surroundings.[4] Consequently visible mould growth on yam chip is very common. Mycotoxin such as aflatoxin which are toxic metabolites produced by fungi under favourable conditions are often associated with such mouldy growth on agricultural products.[5-9] Aflatoxin beyond the tolerance level in food can produce untoward effects such as vomiting, diarrhoea, and convulsion.

It is not too clear what could have produced the untoward effects in these patients since we could not carry out toxicological assessment. We are only of the strong suspicion that the type of preservatives possibly the aldrin chemicals used for these agricultural products could have produced those effects. The role of aflatoxin seems far-fetched going by the findings of very small percentage having aflatoxin above the tolerance level in food for human consumption.[9] Investigation on the type of preservative commonly used by farmers in our environment revealed that mixture with aldrin might have produced the toxic effect as the villagers were in a hurry to sell or consume the products and in the process, went for what they considered effective. The level of toxicity of aldrin depends on the serum level attained after consumption. Concentrations of less than 20 micrograms/l were usually associated with mild poisoning which involved complaints such as nausea, vomiting and epigastric pain, whereas concentration of 100-200 microgram/l were considered to represent moderate intoxication and were associated with nausea, vomiting, epigastric pain, headache, dizziness and convulsions. Severe or fatal cases were associated with levels above 700micrograms/l.[10]

Most of these cases occurred during the dry season, when their store of food must have been depleted and they have no money. Hence, whatever was available were processed in a hurry without going through due process. Furthermore, during this period, the rumour that the agricultural revolution embarked upon by the Kwara State Government will make yam and other agricultural products to flood the market thereby bringing down prices was all over town, resulting in anxiety among the farmers that they may not be able to obtain maximum financial benefit for their products.

Yam and yam chips are produced and marketed to the general populace mainly by subsistence farmers in the rural areas. Their action or inaction is therefore capable of affecting a large number of people. Hence, quick steps should be taken to forestall future occurrences. Such steps include proper education of farmers especially during the dry season on proper processing and preservation of yam flour by agricultural extension workers. At the health institutions, there must be vigilance for cases of food poisoning especially during the dry season. Poisoning from consumption of yam flour should also be considered as a differential diagnosis of seizure disorder and diarrhoea illness, particularly following yam flour ingestion.

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