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Role of cow urine on the onset of leptazole-induced convulsion in Wistar rats

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Abstract
The study investigated the possible preventive role of cow urine on the onset of pentylenetetrazole (leptazole) induced convulsion in Wistar rats. Forty rats (each weighing 100-120g) in four groups were used. Two groups were orally administered with varying doses of cow urine and, after 60 minutes, convulsive dose (0.2ml/kg) of leptazole, administered intraperitoneally. A reference group, not given cow urine, was given same dose of leptazole only, and another group, which was given neither cow urine nor leptazole, served as control. Results showed that cow urine did not prevent convulsion as there was no significant difference ($P<0.05$) in the time of onset of convulsion in the group given cow urine and the reference group that did not receive cow urine. Results also showed that there was no significant difference in the onset time of convulsion between the two groups that were given different doses of cow urine. Four out of the ten rats in the reference group that received only leptazole died within a period 60 minutes after the administration of the drug, while the rest recovered, though they were depressed. Eight out of the ten rats in the group that received single dose of cow urine died, while all ten rats in the group that received double dose of cow urine died within the same period of 60 minutes. This suggests that some constituent chemicals in cow urine may have toxic effects in rats, made worse with the administration of leptazole.

Keywords: Cow urine; Leptazole; Convulsion

INTRODUCTION

Convulsion represents a frequent paediatric emergency in Nigeria, where they are estimated to occur in 15% of hospitalization *(Journal of Paediatrics, 2003).* The health team provides symptomatic treatment and searches for etiology so that adequate treatment can be provided. For a family faced with convulsion, the major concern is how to bring the child from his/her convulsive state at all cost. The products commonly used by parents and other caretakers, including herbalists are cod liver oil, honey, lemon etc, which are administered orally. They are often combined with cow urine to make a concoction, in the hope of provoking vomiting and stimulating the child to regain consciousness. Substances sometimes administered include garlic, onion and rubbing alcohol. Articles such as spoons, sticks, or fingers may also be used in attempt to loosen the jaws and avoid blockages. Use of these techniques has not provided much help to victims, and that explains the high rate of mortality and morbidity following convulsion.

Convulsions are a sudden, violent, involuntary repeated contraction and

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relaxation of a group of muscles in the body, making the victims shake rapidly. It is characterized by uncontrolled excessive activity of either part or all of the central nervous system (CNS). The term convulsion is often interchangeably used with seizure, although there are many types of seizures that have subtle or mild symptoms instead of convulsion. There is a wide-range of possible features of convulsion, depending on what part of the brain is affected. Many types of convulsion cause loss of consciousness with twitching or shaking of the body. Brief blackout followed by period of confusion, sudden falling, drooling or frothing at the mouth, grunting and snoring, cessation of breath may occur. There is also uncontrolled muscle spasm with twitching and jerking of limbs, loss of bladder or bowel control, eye movement, teeth clenching, unusual behaviour like sudden anger, sudden laughter, or picking at one's clothing (Goetz, 2003). The patient may have warning symptoms prior to the attack, which may include fear or anxiety, visual symptoms or vertigo. However, in the case of seizures there are starting spells that can easily go unnoticed. Occasionally, seizures can cause temporary abnormal sensations or visual disturbances. Convulsion (seizure) may occur in such condition as epilepsy, poisoning, high fever (especially in young children), and disturbances of calcium or phosphorus metabolism (such as hypocalcaemia), alkalosis, diabetes, oxygen insufficiency, and a low blood-sugar content, as well as injury to the brain. Treatment must be directed to the underlying cause.

Convulsive seizures are symptomatic of some neurological disorder; they are not in themselves a disease entity. In animals they most often caused by infectious agents and toxins. Convulsions are also produced by any of a number of metabolic disorders, such as hypoglycaemia, and hormonal imbalances; brain cell injury from head trauma; tumors and degenerative neural diseases; anoxia and haemorrhage, which deprive the brain cells of vital substances; and acute cerebral oedema, which interferes with normal brain cell functions (Goetz, 2003). A future febrile convulsion is more likely if the first occurs in a child younger than 15 months, if there is a family history of febrile convulsions in close relatives (father, mother, sister, brother). Once the child is past three years old, the chance of recurrence becomes less likely. Only about 1% of children do subsequently develop epilepsy (this is more likely if the child has a longer than normal convulsion, or recurrent seizures in the same illness (Airede, 2007). Convulsion/Seizures can generally be classified as either 'simple' (no change in the level of consciousness) or 'complex' (change in level of consciousness). It may also be classified as generalised (whole body affected) or focal (only one part or side of the body affected). Another classification is based on the area of the brain affected; Grand Mal (characterised by extreme neuronal discharges in all areas of the brain), and Petit Mal (which involves the thalamocortical brain activating system). Generally, convulsion can be unsettling to watch. Despite their appearance, most convulsions are relatively harmless. They usually last from 30 seconds to 2 minutes. However, if a seizure is prolonged, or if multiple seizures happen and the person doesn't awaken in between, it becomes a medical emergency (Ford, 2001).

Urine is usually yellow or clear, depending upon a person's health and diet. It usually has ammonia-like odour due to the nitrogenous wastes that make up about 5% of the fluid (the remaining 95% is water). Certain food can affect the odour, however, for example, asparagus breaks down into several sulphur containing compounds that impart a putrid odour upon excretion. Urine is a slightly acidic fluid which carries waste from the kidney to the outside world. The kidneys have millions of nephrons, which

filter toxin, waste, ingested water and mineral salts out of the bloodstream. The kidneys regulate blood acidity by excreting excessive alkaline salts when necessary. The chief constituent of the nitrogenous waste is urea, a product of protein decomposition. Urea is, among other things, a diuretic. Average adult urine production is from one or two litres a day. In addition to uric acid, ammonia, and creatinine, urine consist of many other waste products in minute quantities.

Urine therapy refers to one of several uses of urine to prevent or cure sickness, to enhance beauty, or to cleanse one's bowels. Most devotees drink the midstream of their morning urine. Some prefer it straight and streaming hot, others mix with juice. Some prefer a couple of urine drops mixed with a tablespoon of water applied sublingually several times a day. Some wash themselves with it to improve their skin quality.

Cow Urine Concoction (CUC) is a traditional herbal preparation commonly administered to convulsing children by the Yoruba speaking people in Nigeria. For a long time, traditional healers have been managing convulsion with this concoction prepared with cow urine and other herbs, even though its use is however complicated by severe poisoning (Ayorinde *et al.,* 1982). It is locally called *agbo giri* or sometimes *agbo tuu.* This herbal preparation is often administered in all types of convulsive seizures, irrespective of their causes. Though the concoction has helped many children recover from convulsion, its use has also resulted in death of many others in Nigeria, either due to poisoning from its constituent ingredients, the unguarded dose, or the mode of administration (Osuntokun *et al.,* 1980). The concoction is prepared is prepared from tobacco leaves, garlic and basil lemon juice, rock salts and cow urine. It is also reported that while the herbs and other ingredients may vary from one concoction to another, cow urine remains the vehicular solution for all of them (Oyebola *et al*., 1975). Methyl chloride extracts from two samples of the preparations were analyzed by direct application of gas chromatography-mass spectrometry (gc-ms). The gas chromatographic traces indicated over 50 chemical compounds in the concoction, with nicotine, p-cresol, thymol, phenyl acetic acid and benzoic acid as the major constituents (Oyebola *et al.,* 1983). This makes it difficult to identify which of the ingredients plays the vital role of managing the convulsion. It also makes it difficult to know which of the ingredients is/are poisonous to the patients that in fact killed, in the cases where deaths have been recorded. Also there was a recent study reports that cow urine concoction has a depressive effect on the bile flow, and that it also significantly reduces the concentration of sodium and bicarbonate in bile (Alada, 2001).

EXPERIMENTAL

Materials. Forty (40) adult Wistar Rats weighing between 100 and 120g obtained from the Animal House of the Department of Pharmacology of University of Jos, and were kept four separate cages under standard laboratory conditions. Fresh cow urine was obtained from a healthy male cow at the National Veterinary Research Institute (NVRI), Vom, Plateau State, using inflatable catheter (Cunningham *et al*., 2004); (Magner *et al*., 2005). Pentylenetetrazole (leptazole) was obtained from Pharmacology Department of Ahmadu Bello University (ABU), Zaria and diluted to appropriate concentration at the Department of Pharmacology University of Jos. A stop watch was used in recording time.

Method. The 40 male and female rats were randomly grouped into four of 10 rats and kept in four separate cages, and given access to feeds and water.

Group A – Rats in this group, which served as control, were given 0.2ml of Normal Saline orally

Group B – Rats in this group, which served as reference, received a convulsive dose of 0.2ml/kg of

pentylenetetrazole (leptazole) intraperitoneally (ip) only

Group C – Rats in this group received 0.2ml/kg of pentylenetetrazole (leptazole) intraperitoneally (ip) 60 minutes after they received oral administration 0.2ml of cow urine.

Group D – Rats in this group received 0.2ml/kg of pentylenetetrazole (leptazole) intraperitoneally (ip) 60 minutes after they received oral administration 0.4ml of cow urine.

The time of administration of the drugs and the time of onset of convulsion were recorded in each group. The behavioural changes after administering cow urine to the rats in Group C and D were also noted before administering leptazole. The onset (in minute) of onset of death and recovery among rats in the groups was also recorded. And number of death and number of recovery among each group was equally recorded, as shown in the tables below.

RESULTS AND DISCUSSION

The results indicate that cow urine only did not prevent convulsion, neither did it delay the onset of convulsion as there was no significant difference ($P > 0.05$) in the onset of convulsion between the group of rats given the 0.2ml of cow urine and the reference group that did not receive cow urine at all, when both groups were induced with convulsion using 0.2ml/kg of leptazole. It was also observed that there was no significant difference ($P > 0.05$) in the onset of convulsion between the groups that were given varying doses of cow urine, indicating that not even a high dose could prevent or delay onset of convulsion. It also indicates that cow urine is not the ingredient in the cow urine concoction that cures, prevents or delays the onset of convulsion.

Table 1: Time of onset of convulsion in each group

	Group A	Group B	Group C	Group D
Time of onset of convulsion (min)	-	1.55 ± 0.16	1.25 ± 0.17*	1.25 ± 0.19**

Mean ± SEM for 10 determinations *P > 0.05; **P > 0.05 when compared with reference group

Table 2: Number of deaths and recovery in each group

	Group A	Group B	Group C	Group D
Total No of death	0	4	8	10
Total No of recovery	0	6	2	0

In the cases where the concoction have worked to prevent or cure convulsion, there may have been the possibility of interaction between the various ingredients of the concoction when mixed together to make the treatment effective. Though the rats did not die of poisoning, 60 minutes after the administration of single and double doses of the urine, with a convulsive dose of leptazole, it was observed that there were more deaths recorded in the groups of rats that were treated with the urine. This suggests that some of the chemical compositions of cow urine (e.g. ammonia, urea, and hippuric acid) may have some neuro-toxic effects on the rats which became complicated when the chemicals reacted with the leptazole, resulting in more deaths. It also suggests that there is a possibility of interaction between cow urine and leptazole that may have some lowering effects on convulsion threshold by depleting the concentration neurotransmitters (like serotonin and norepinephrine) that could prevent convulsion. Cow urine showed CNS depressive actions, such as reduced alertness and locomotion and diminished response to touch.

Conclusion. Cow urine does not prevent or delay onset of convulsion, even in high dose. It has some depressive action, and may also have some toxic effects when administered; therefore it should not be used for the purpose. Healthcare providers that treat patients with cow urine concoction would get

better results if the cow urine is removed from the concoction or replaced possibly with distilled water.

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