Clinical Observations on Toxic Effects of Xhosa Medicine

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SUMMARY

Toxic effects of Xhosa medicine causing morbidity and mortality were observed among inpatients in a mission hospital in the Ciskei. In all recorded cases the intake of Xhosa medicine was confirmed by the patient or his relatives, but no details are known about the nature of the substance used. An attempt was made to group the observations according to the main presenting features: dehydration, paralytic ileus, obstruction, anaemia, alterations of transaminases and blood urea, deterioration of an underlying disease, and severe respiratory distress in infants. Treatment was, with one exception, symptomatic, and the mortality rate was high.

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Every doctor working in a rural area is aware of the important role extracts from plants play in the patient's or his family's efforts to combat an ailment, a disease or a misfortune. The term 'Xhosa medicine' (*yeza lesi Xhosa*) means any extract or concoction made by the people themselves or obtained from a herbalist or a witchdoctor, and supposed to have medicinal effects. I use this general term 'Xhosa medicine' because I am not in a position to give any details of the substances used. We do not ask every patient if he or she uses Xhosa medicine because of the negative psychological effect this might have. Only when the patient's condition cannot be explained by known pathophysiological features do we do so, and in most cases we get an affirmative answer, although often only at a later stage.

I should like to report on clinical observations made on inpatients in whom, in our opinion, the effect of Xhosa medicine (*a*) was the only reason necessitating hospital admission; (*b*) complicated the underlying or original disease; or (*c*) was the suspected cause, or at least a contributing factor, to the fatal outcome.

PATIENTS AND METHODS

An analysis was made of 50 patients, aged between 14 and 70 years, of whom 16 were males and 34 were females. They were admitted, between September 1972 and January 1974, to our hospital which is situated in the northern part of the Ciskei. Observations made in 26 infants between the ages of 3 and 12 months and admitted between January 1973 and February 1974, were also recorded.

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In all instances the suspected intake of Xhosa medicine had been confirmed by the patient or his relatives. Cases where there was strong suspicion on clinical grounds only were not included in the series. The medicine had been taken for some discomfort, such as headache, stomach ache and joint pains, or because the patient hadn't felt substantial relief after attending a clinic or a doctor or the hospital, particularly in the case of chronic sickness or for some non-medical reason. Some readily admitted the intake of a large quantity of medicine over a long period.

In assessing the toxic effect of the Xhosa medicine, different symptoms, either alone or in combination, were observed. An attempt was made to group the cases in relation to the main presenting feature. Some overlapping was unavoidable.

RESULTS

Diarrhoea, Vomiting and Dehydration

Diarrhoea and vomiting caused by the use of a purgative were the main, or at least one, symptom in 29 patients. Fourteen of these patients had to be admitted to hospital because they were in a state of dehydration. The reasons for the intake of a purgative were: epilepsy, pregnancy, postpartum, cough, and weakness after a typhus infection from which the patient had just recovered in hospital. Six of these 14 patients needed intravenous infusion over 24 - 48 hours. One middle-aged male patient had completely collapsed and was semiconscious. He and 3 female patients had an elevated blood urea (58 - 117 mg/100 ml). Only one of these patients showed a temporary albuminuria and erythrocytes in the urine sediment.

Twelve patients responded well within a few days of treatment. Two patients died: the first one, a female witchdoctor, 40 years old, admitted that she had taken medicine for a long time in order to vomit. No underlying pathological condition was found. Diarrhoea and vomiting could not be stopped in spite of intensive treatment (infusions, oxytetracycline, Flagyl, Chloromycetin, dexamethasone, etc.). The second one, a middle-aged man, was brought by his witchdoctor, who had treated him during the preceding week. He died after 5 days, under similar circumstances as the first patient.

Paralytic Ileus

Seven patients presented with the symptoms of paralytic ileus (very distended abdomen, hiccough, vomiting, missing bowel sounds) and were treated with intravenous infusions,

Wangensteen suction and Prostigmin. A middle-aged woman who had allegedly taken the Xhosa medicine for pains in the joints, died on the day of admission. The 6 other patients recovered.

Bowel Obstruction

A 55-year-old man who had taken a Xhosa purgative for pains in the joints and the chest, presented classic features of a mechanical obstruction. Laparotomy was done immediately. A volvulus of the jejunum, ileum and sigmoid colon was found, together with gangrene, which necessitated the resection of 4 metres of small bowel. The patient recovered.

Anaemia

Only cases of severe anaemia, with a haemoglobin level below 6,5 g/100 ml (measured with a Zeiss electrophotometer) are recorded here. Eight patients were observed with haemoglobin between 2,2 and 6,4 g/100 ml. In 5 cases the anaemia was normochromic (Hb-E 25,0 - 28,0), once hypochromic (Hb-E 20,0) and twice hyperchromic (Hb-E 31,8 - 37,0). The severe anaemia was not the only pathological feature in these cases, but was either combined with other symptoms, or complicating an underlying disease without being caused by the latter. Unfortunately no investigations have been made to verify or exclude a possible haemolysis. There is only one relevant observation: the serum of 1 woman with a haemoglobin level of 5,1 g/100 ml could not be obtained for investigation because the blood was haemolysed on several occasions. Figures for the total leucocytes were between 3 900 and 10 700/mm^3. Blood smears showed a marked shift to the left in 3 cases. Two of these are described in detail.

Case 1: A 14-year-old girl was given Xhosa medicine by her parents for an unknown reason. She was originally admitted with symptoms of a paralytic ileus and a moderate anaemia. The haemoglobin dropped from 7,8 (Hb-E 31,8) to 4,2 g/100 ml within the following days. Leucocytes were 5 900/mm^3 on admission, and rose to 10 700/mm^3 after 10 days, with a very marked shift to the left: promyelocytes 6%, myelocytes 10%, unsegmented 10%, polymorphonuclear leucocytes 64% and lymphocytes 10%. The bone marrow showed the picture of a megaloblastic anaemia. There were also signs of toxic liver damage (see under 'Transaminases'). Chest radiographs, blood urea and CSF were normal. Serological tests (Widal, Weil-Felix, Bang) were negative. The girl recovered completely after 2 months in hospital.

Case 2: A middle-aged woman admitted to having taken a quantity of Xhosa medicine. On admission she was in a very miserable condition and had a haemoglobin level of 2,2 g/100 ml (Hb-E 37,0). Leucocytes were 6 300/mm^3. The blood smear showed polymorphonuclear leucocytes 47,5%, eosinophils 0,5%, lymphocytes 56%, megalo- and normoblasts, and Howell-Jolly bodies. One week later the haemoglobin had risen to 5,9 g/100 ml (Hb-E 28,8) and the leucocytes were 8 000/mm^3. The blood smear now showed: myelocytes 2%, unsegmented 9%, polymorphonuclear leucocytes (oversegmented only) 49%, eosinophils 2%, monocytes 8%, lymphocytes 30% and, still, all forms and stages of erythrocytes. Symptoms of an underlying mild chronic pyelonephritis were present (urine culture: *Bacterium coli*, minimal changes on the right side in the intravenous pyelogram, normal blood urea and blood pressure), but did not explain the haematological alterations. The woman recovered within 2½ weeks.

Transaminases

SGOT and SGPT were done in 30 of the patients and were found to be elevated in 17. (SGOT and SGPT were done by the colorimetric method with a Zeiss electrophotometer and the test substance from Boehringer for which the normal values are up to 12 mU/ml.) In all 17 cases the SGOT level was higher than the SGPT level. Eight SGOT levels were between 18 and 50 units, and 9 between 50 and 280 units. The highest SGPT level was 80 units. Control tests done in 4 cases some days after the first examination showed a significant lowering of the levels.

Serum bilirubin and alkaline phosphatase determinations were done at the same time. The latter were inconclusive. The serum bilirubin was only once increased to 2,5 g/100 ml, in a young girl with paralytic ileus and severe anaemia (see case 1 under 'Anaemia'). In this case the SGOT was 80, and the SGPT 70 units. The liver biopsy specimen showed occasional areas of partial necrosis and mild inflammatory exudate, with the cause of the lesion not being evident. Bilirubin, SGOT and SGPT levels returned to normal within 3 weeks. Liver needle biopsies done in 3 other cases yielded normal results.

Blood Urea

The blood urea was tested in 34 patients and was above 40 mg/100 ml in 17. In 9 patients the increased blood urea was definitely not caused by an underlying kidney disease, nor could it be explained by dehydration, and it was found to be normal after 7 - 10 days. There was a coincidence of increased blood urea and albuminuria in several but not all of these 9 patients. The albuminuria was not caused by high temperature and disappeared within a few days.

Deleterious or Fatal Effect on the Original Disease

In 10 cases the intake of Xhosa medicine seems to have had a deleterious or fatal effect on the original disease. This is, of course, impossible to prove, but it seems to be most likely, considering the circumstances of these cases.

Five of these patients were suffering from kidney disease. They all admitted that they had taken Xhosa medicine for a long time and in considerable amounts. Only 1 woman with a mild chronic pyelonephritis (see under 'Anaemia') recovered; the 4 men died. Two young men, suffering from a subacute nephritis and pyelonephritis

respectively, developed complete anuria. A middle-aged man suffering from a pyelonephritis and whose blood urea was only raised to 100 mg/100 ml, had a normochromic anaemia (haemoglobin of 5,1 g/100 ml) and died of uncontrollable diarrhoea after the use of a Xhosa purgative. An elderly man showing signs of a chronic nephritis died, although the blood urea was only slightly increased, the blood pressure normal and the excessive albuminuria seen on admission had disappeared before he died.

Two of the patients showing exacerbation of the original disease were suffering from abdominal tuberculosis. A young man was successfully treated for a tuberculous peritonitis in 1972, but did not return for treatment after being discharged. He attended witchdoctors, but finally came back to us one year later in a very poor general condition, complaining of constant vomiting, and with a moderate anaemia (haemoglobin 10 g/100 ml), a blood urea of 89 mg/100 ml and an increased SGOT level (32 units). He improved quickly and a laparotomy confirmed the presence of mesenteric tuberculous glands. A middle-aged man showing symptoms of tuberculous peritonitis, and whose condition had deteriorated fast after intake of Xhosa medicine, had anaemia (haemoglobin 7,6 g/100 ml) and a persistent hiccough, and died after 11 days, in spite of intensive treatment.

A young woman had visited a doctor because of generalised complaints. When she did not get better she went to a witchdoctor. When the condition deteriorated she attended another private doctor who referred her to the hospital. The Widal reaction proved that she was suffering from typhoid, but this does not explain the severe anaemia (haemoglobin 2,2 g/100 ml), for which the Xhosa treatment was probably to blame.

The Xhosa medicine could have been responsible for perforation of the ileum in an elderly man who attended our outpatient department, complaining of ill-defined symptoms. After receiving treatment he was told to report back after a few days. As he readily admitted, he had taken Xhosa medicine instead and had felt much worse 3 days later. He was then referred back to us by a private doctor. On laparotomy a perforation of the ileum was found with no causal factor. Widal and Weil-Felix reactions were subsequently done and the latter turned from negative to positive during the following week.

The intake of Xhosa medicine also seemed to have had a substantial influence on the fulminant course of Hodgkin's disease affecting the paratracheal and hilar glands of an 18-year-old male patient. Three months after a spontaneous remission from a first attack he was readmitted in a miserable condition, with severe anaemia (haemoglobin 3,5 g/100 ml). He developed anuria and died within 2 weeks.

Observations in Infants

A typical clinical picture was observed in 26 infants between the ages of 3 and 12 months. The main feature was severe respiratory distress (dyspnoea, tachypnoea, restlessness) at first sight suggesting pneumonia (in fact, several of the infants were sent to us by private doctors with this diagnosis). There was tachycardia, an ill-defined but characteristic smell, flabbiness of the limbs and, in some cases, semiconsciousness. The temperature was subnormal to febrile. Diarrhoea and vomiting were not outstanding features, and there was no marked degree of dehydration. The nutritional condition in all cases was at least satisfactory and often very good.

The use of Xhosa medicine, often given by grandmothers, was 'indicated' by some minor ailment, such as cough or stomach-ache, and there were other reasons given, such as 'to drive out a ghost' or 'to make the baby beautiful when the father comes on holiday'.

In all instances auscultation and chest radiographs did not reveal a cause for the dyspnoea. The latter showed either no pathology at all or gave a minor finding such as primary pulmonary tuberculosis. The size and shape of the heart were within normal limits. ECG readings done in 4 cases were normal. Haemoglobin was not lower than that in most of the infants seen at this hospital.

Intensive treatment with intravenous infusions, digoxin, antibiotics, prednisolone, Cortensor and oxygen was unsuccessful in 11 of the first 12 cases. Six infants died within the first 12 hours, 3 within 36 hours, 1 after 3 weeks, and only 1 survived.

In the search for an explanation of the dyspnoea we considered the possibility of methaemoglobin formation. Unfortunately, no laboratory investigations on this aspect were done, although the appropriate treatment was instituted in 14 cases during the last 3 months. On admission a 1% solution of methylene blue 0,2 ml/kg bodyweight was given intravenously, together with vitamin C 100 mg/kg body weight. In all cases vitamin C injections were continued for one week, and in 4 cases a second dose of methylene blue was given within the first 24 hours. The respiratory distress improved substantially within the first 30 - 60 minutes in 9 infants, and they all recovered completely. Three infants, already semiconscious on admission, died within the next 24 hours, and 2 infants died later.

DISCUSSION

As has been mentioned previously, it was not possible to gain any information on the substances used, and in many cases the patients and their relatives seemed to have little idea about the origin of the medicine they had at home or had obtained from a neighbour. It is therefore impossible to relate the clinical condition observed with the intake of a particular substance. The alleged causal connection can only be postulated because a patient's history suggests that Xhosa medicine was taken, often for some minor complaint or for no physical complaint at all, because in many instances the patient admits that the condition deteriorated substantially after the intake, and because the patient presented in a serious condition which is not related to the original complaint or underlying disease.

The most common effect of Xhosa medicine is a purgative one. The fact that purgatives are commonly-used substances is not new. But it is a matter of concern that they cause severe dehydration, necessitating hospi-

talisation and causing death. Cases of paralytic ileus as well as those of volvulus and small-bowel perforation can be explained by the action of a purgative. Treatment is, naturally, only symptomatic. Since postmortem findings are not available, only probable reasons for its failure can be suggested in some instances: a too severely deranged electrolyte balance or a direct toxic influence on vital organs.

Only severe cases of anaemia (haemoglobin below 6,5 g/100 ml) are recorded because a moderate degree of anaemia is a common feature in our patients. Since hypo- as well as normo- and hyperchromic anaemia were observed, it is likely that different pathophysiological mechanisms play a part: direct influence on the erythrocytes with consequent haemolysis, disturbed absorption of anti-anaemic factors and damage to the bone marrow. The latter is likely in cases which present, in addition, a marked shift of the leucocytes to the left.

The elevated levels of SGOT and SGPT found in 17 out of 30 patients, and the fact that the SGOT level was in each case higher than the relevant SGPT level, indicate necrosis of cells. In 1 case areas of partial necrosis in the liver were found histologically. It is likely but not certain that the elevated transaminase levels were caused by toxic damage to liver cells. The medicine taken could be responsible for this, either directly or indirectly. A coincidence of elevated transaminase and blood urea levels was observed in several patients, but no real correlation could be found. The increased blood urea and albuminuria also point to toxic damage to cells, namely the tubuli of the kidney.

The observation of sick children and infants often suggests the negative influence of Xhosa medicine. But in most cases it is impossible to draw a line between this suspected effect and the symptoms of malnutrition and infection. This does not apply to an observation of severe respiratory distress in 26 infants under the age of 12 months, most of whom were very well nourished. The rapid improvement in 9 out of 14 infants who received a course of methylene blue and vitamin C injections seems sufficient evidence for the suspected methaemoglobinaemia, after intensive symptomatic treatment in a previous group of 12 had failed in 11 infants. An attempt to verify the methaemoglobinaemia by laboratory tests is planned. A similar condition was observed in the 1 - 3-year age group, but it was much less dramatic.

With the exception of this observation in infants, no relation between the age group and the symptoms was found. All cases recorded were from very different locations and districts, and no connection between a specific area and a specific toxic effect could be established.

Not included in this study were several patients with semiconsciousness and fits. Although Xhosa medicine was suspected as a causal factor, epilepsy and other cerebral diseases could not be completely excluded.

Except in the case of suspected methaemoglobin formation in infants, the treatment was symptomatic. Twelve patients in the 14 - 70-year age group died. Seven of these belonged to the group with deterioration of an underlying disease. Only 10 survived out of the infant group, and 9 of these after the introduction of treatment with methylene blue and vitamin C.

The facts outlined above stress the influence of Xhosa medicine on morbidity and mortality in the patients attending our hospital. *This should also make us aware that our medical approach is still far from meeting the needs of the population we serve.* It should further remind us of the vital importance health education should play in our daily work.

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