The role of the traditional bonesetter in primary fracture care in Nigeria

J E Onuminya

Background. In view of the growing interest in the management of fracture worldwide, the traditional bonesetter (TBS) practice in Nigeria was documented.

Objective. To highlight the role of the TBS in primary fracture care in Nigeria.

Setting. Rural.

Study design. Over a 5-year period a qualitative study of the TBS settings and knowledge, diagnostic techniques and principles of fracture treatment in four TBS centres in Nigeria was carried out by active participation, on the spot assessment, interactive dialogues and oral interviews.

Results. It was found that TBS services are well preserved as a family practice, and training is by apprenticeship. Records are kept by oral tradition. There is no prescribed fee and the patronage is high. Fracture diagnosis is based on physical assessment and experience. The TBS relies solely on the conservative method of fracture treatment, and all fractures are reduced by the closed method and stabilised with an external traditional splint and a protracted period of immobilisation. The outcome of TBS treatment is good for closed fractures of the shaft of the humerus, ulna, radius and tibia, but poor for peri-articular and open fractures. Non-union, malunion, traumatic osteomyelitis and limb gangrene were the common major complications of TBS treatment.

Conclusion. Despite criticisms and antagonism from orthodox medical practitioners TBS practice is well patronised by Nigerians. In order to guarantee safety and efficiency of the TBS practice in primary fracture care service delivery in Nigeria, there is therefore a need both to educate the community and to train the TBS.

S Afr Med J 2004; **94:** 652-658.

The traditional bonesetter (TBS) is a person who is recognised by the community in which he lives as competent to set bones. Traditional bonesetting is part of the practice of traditional medicine in Africa and in every Nigerian community there is at the very least a TBS who treats fractures and other orthopaedic problems. Over 70% of the rural population in Nigeria still rely on the TBS for primary fracture care. The TBS appears to have met the needs of our communities for many centuries and existed long before the arrival of orthodox medicine. Each TBS believes in the ability of his medications and traditional splints to heal fractures. TBS practices are well patronised by the community, and the indigenous people do not believe in failure of the TBS treatment, inability to get the desired result being blamed on other forces such as the severity of the initial injury, ancestral spirits or attack by perceived enemies;[1,2] hence, thaumaturgy plays a dominant role in the TBS treatment of fractures in our environment.

Hitherto the TBS has kept his practice a family secret,[1-3] claiming that his skill is acquired as part of ancestral heritage. And little effort has been made to study the TBS practice.[1] Most of the available reports on the TBS's knowledge, attitudes and practice in our environment are hospital-based retrospective data focusing mainly on the complications of the TBS practice[2-5] because these present to the hospitals. There is now genuine interest in various traditional practices among practitioners of modern medicine,[1,6,7] and growing numbers of traditional practitioners are beginning to accept and use some of the modern technologies.[7] This will help foster teamwork among all categories of health workers within the framework of primary health care (PHC).

I believe that the TBS, like the traditional birth attendant (TBA), has a significant role in primary health care delivery in Nigeria. A great deal of collaborative effort between national government and international agents has gone into the training of TBAs so that they can be incorporated into health care service delivery, especially maternal and child care services.[6,7] However, despite widespread patronage of the TBS practice in Nigeria these services seem to have been neglected by government because of mutual antagonism, distrust and contempt on the part of the TBS and orthodox medical practitioners. The opposition was so extreme that the late Professor Millar O A Jaja stated in 1991 that 'No one should force an amalgamation of orthodox and traditional medicine — water and oil do not mix' (unpublished lecture). He made it clear that the basis of surgery today is anatomy, physiology and pathology. 'If you are ignorant of these what do you want

Department of Orthopaedics and Traumatology, Faculty of Clinical Sciences, College of Medicine, Ambrose Alli University, PMB 14, Ekpoma, Edo State, Nigeria

J E Onuminya, FMCS

with surgery?' He could not bring himself to subscribe to an unorthodox practice where prayer, miracle and magic added up to what he saw as pure quackery. But abandoning TBS practice has not relieved the health burden of our people, especially in the area of primary fracture care delivery, where there is beginning to be a decline in the quality of care offered by the TBS to our teeming rural population. I believe that there is much that we can gain in terms of self-reliance, safety and effective primary fracture care service delivery in Nigeria by studying the TBS services.

This paper reports on participatory documentation of the TBS practice in Nigeria.

Study design

Between August 1997 and July 2002 I carried out a participatory documentation of the TBS practice in four major centres in the north-central and south-south zones of Nigeria. I studied the TBS settings and knowledge, diagnostic techniques and principles of fracture treatment. In each of the centres a mutual rapport was established with the chief TBS in charge of the centre and informed consent was obtained for the qualitative study.

I made on the spot assessments and had interactive dialogues with the TBS, patients and community leaders. I conducted oral interviews among the groups in each of the centres about the TBS's perceptions and beliefs and about the management of fractures with emphasis on the methods of fracture diagnosis, principles and outcomes of treatment. The findings were recorded and analysed manually.

Results

Setting

Established TBS centres were found to be an integral part of the communities at Vom in Jos South Local Government Area (LGA) of Plateau State, Agumagu in Ankpa LGA of Kogi State, and Afuze in Owan East LGA and Ogua in Esan West LGA of Edo State. The TBS practice is well patronised by the indigenous community in all walks of life. The TBS centres were well recognised by the community, and in most places the centres are named after the town or the chief TBS for easy reference.

In each of the TBS centres there is a chief TBS, who is chief physician and the head of the family. He keeps the TBS practice a family secret and enjoys the services of several apprentices, who are often members of the same family. Services are offered on an outpatient or an inpatient basis according to the directives of the chief physician. Consultations and treatments are usually carried out in the TBS family house, sometimes in the open space within the premises. Relations of the chief physician and the patient often assist in the treatment of the fractures.

In most of the TBS centres inpatients are managed on mats or mattresses on the floor (Fig. 1). In a few centres patients are housed in purpose-built wards equipped with beds and other conveniences (Figs 2A - 2D).

Fig. 1. This patient, seated on mats on the floor of a TBS centre, had a closed fracture of the proximal third of the left tibia and developed gangrene of the leg while being treated by the TBS with a traditional splint. He accepted an above-knee amputation of the limb after 5 months of stay in the TBS centre.

Fees

Apart from a monthly charge for accommodation, which ranges from 100 to 200 naira in the various centres (135 naira = 1 US dollar at the end of May 2004), fees paid for treatment are at the discretion of the patients. Payments are made in cash or in kind at the end of successful treatment. Some patients make pledges, which they redeem voluntarily at the end of successful treatment. When a patient is dissatisfied with the TBS treatment he or she is free to leave the centre at will without cost.

Fig. 2A. A typical TBS centre located at Afuze in Owan East Local Government Area of Edo State, Nigeria. The centre was built to accommodate the TBS's family, patients and their relatives. There are 25 rooms, each of which accomodates 3 patients with their relatives.

Fig. 2B. The signboard on the way to the centre.

Records

Oral tradition is the main method of record keeping in the TBS centres. Patients are remembered by their names, by names of their influential relatives or their towns, or by their occupations. The TBS often classifies patients into male and female or child and adult.

Fig. 2C. A hand-dug well in the courtyard, the main source of water for the centre.

Fig. 2D. The back view of a block of the centre, showing how it relates to the neighbouring communtity.

Diagnosis

The diagnosis of fracture by the TBS is based on physical assessment and experience of the chief physician. Pain, swelling, tenderness, limb shortening or deformity, presence of a gap between broken fragments, abnormal movement and loss of function of a limb following trauma are recognised as physical signs of fracture.

On the basis of physical assessment the TBS will describe a fracture as open or closed, displaced or undisplaced, single or multiple in relation to the part of the limb involved. Some of the chief physicians rely on the reports of X-ray films done in orthodox hospitals to further describe fractures as complete or incomplete, simple or complex. They appreciate the danger associated with open fractures, but some of them claim that they have knowledge of herbs that can be used to heal the wound (Figs 3A and 3B). Most TBSs will attempt to treat the wound with herbs and some employ the services of a nurse to manage the wound for them.

Fig. 3A. A pot of prepared herbs used by the TBS for treatment of fracture.

Fig. 3B. A female outpatient being treated with the prepared herbs for suspected dislocation of the right shoulder.

Principles of fracture treatment

Most TBSs accept all types of fractures for conservative treatment, including spinal and open fractures (Fig. 4). As a matter of principle the TBS believes that a broken bone should be reduced and kept in a fixed position to prevent further damage and allow healing to take place. It has been observed that fractures in children take 1 month to heal, those in a middle-aged patient 2 months and those in old people 3 months. A properly united fracture is defined as absence of gaps between the broken fragments, no shortening deformity, and return of painless, easy movements. The TBS believes that the worse the break or the older the person, the longer healing will take; children's bones heal rapidly, old people's sometimes never join. For specific cultural reasons patients are rarely referred to colleagues. The TBS relies on the strength of his herbal preparations to control sepsis. Generally the TBS applies the basic principles of orthodox fracture treatment, viz. reduction, stabilisation and (to some extent) rehabilitation.

Reduction

The TBS mainly employs closed reduction, generally by traction or manipulation by local pressure and without anaesthesia. Two methods of closed reduction are recognised.

Physical method. This is carried out by steady traction and countertraction by assistants, while the chief physician manipulates and massages the bone fragments into acceptable positions. This procedure is carried out repeatedly until the desired reduction is achieved. The patient is often encouraged to bear this painful procedure under restraints.

Remote control method. Some chief physicians believe in the use of a traditional remote control means of achieving

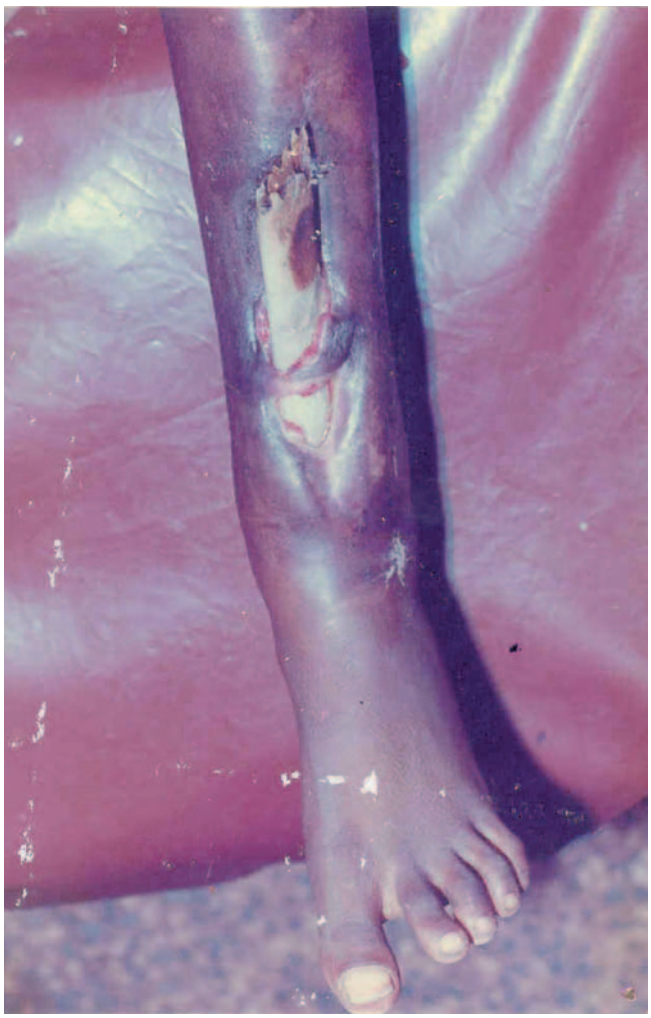

Fig. 4. An infected severe open fracture of the distal third of the left tibia seen in the TBS centre — note the exposed and necrotic bone. In spite of adequate counselling the patient refused orthodox operative treatment owing to a mistaken belief that the leg would be amputated in hospital.

reduction of fractures. They will deliberately fracture a fowl's limb for sequential reduction and manipulation, claiming that while the fowl's limb is being reduced the patient will experience reduction in his or her fracture site. General belief is that when the fowl's limb is set, the patient's fracture will be set as well. This practice also involves some traditional rites, which have not been fully elucidated.

Stabilisation

Stabilisation is achieved by the application of a traditional splint, fixed traction, anti-rotation devices and bandages fashioned from locally available materials. A temporary leg or arm splint can be made of folded papers, dried banana leaf or palm leaf. The traditional splint is made from pieces of stick woven together with thread. This is bandaged directly over the fracture site, e.g. in a fracture of the shaft of the humerus, but it can also be applied below the fracture site, e.g. in a fracture of the neck of the femur, where it is applied on the thigh, or above the fracture site, e.g. in an ankle fracture where it is applied on the leg. The patient believes that it is the splint that heals the fracture, and its application is the focus of interest. Once the fracture has been reduced scarification marks are made with a sharp blade over the fracture site, and then the site is massaged with a herbal medicament. It is then wrapped in a piece of old cloth or newspaper, and the splint is applied firmly and bandaged (Figs 5A and 5B). The massage is repeated at prescribed intervals until there is empirical evidence of union.

The TBS emphasises proper application of the splint. It should not be too loose or too tight. A loose splint will not serve any purpose, while a tight one may cause pain, swelling and suppuration of the underlying tissues. If the patient complains that the cast is too tight or if the fingers or toes become cold, white or blue, the splint is removed and a new looser one is applied. For open fractures the wounds are dressed before the splints are applied. A broken arm should be kept in a splint for about a month, and no force put on it for another month. A broken leg should remain in the splint for about 2 months. The splint is removed when there is clinical union of the fractures.

Rehabilitation

In most TBS centres protracted confinement to bed is imposed on patients with fractures of the major bones. Once the fracture site has become less painful a walking stick or locally made crutches are used for support and to aid mobilisation in the lower limb. For upper limb fractures patients are allowed to mobilise with the limb in the most convenient position. In some centres a collar sling fashioned from a piece of old cloth or thread is used for additional support until union is achieved.

Fig. 5A. The traditional splint used by the TBS in the treatment of fractures.

Fig. 5B. A typical TBS splint applied for the treatment of the fracture of the tibial shaft.

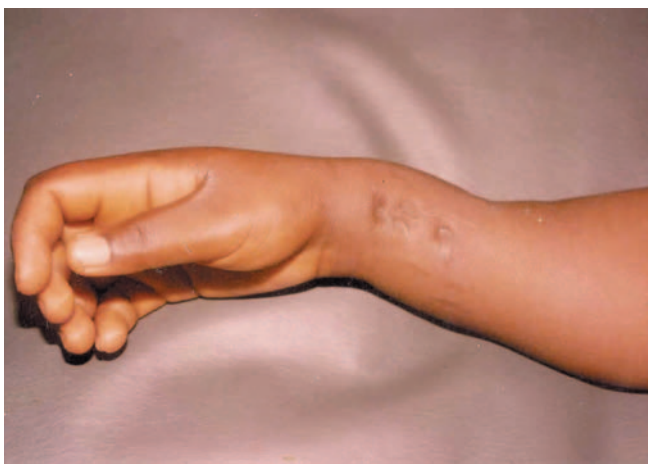

Fig. 6. A mal-united Colles fracture treated by a TBS. The patient, a farmer, was satisfied with the restoration of function in the hand.

Outcome of treatment

Fracture healing is judged empirically by the TBS. Emphasis is laid on bone union and restoration of function (Fig. 6). Less attention is paid to complications. Treatment is most successful for the closed fractures of the shaft of the humerus, ulna, radius or tibia, results being poor for peri-articular and open fractures. Shortening was found to be a common complication in femoral fractures. Non-union, malunion, traumatic chronic osteomyelitis and gangrene were the common major complications of TBS treatment.

Discussion

The TBS plays a major role in the management of fractures in Nigeria, providing primary fracture care for over 70% of the population in the rural areas. TBS practice also accounts for about 80% of fracture morbidity in our hospitals, with gangrene resulting from treatment by a TBS accounting for 60% of major limb amputations in Nigeria.[2]

Fracture treatment is undergoing a rapid revolution worldwide. Relatively few progressive fracture centres now employ conservative treatment with protracted bed confinement. Emphasis is on early mobility and rapid return to the home environment; internal fixation is therefore becoming the preferred choice of treatment, even in rural settings.[8] In spite of the progress in fracture treatment, the TBS has continued to use the conservative method to treat every fracture. Several authors have reported that careless handling of patients with fractures by the TBS has converted simple problems to serious, irreparable ones,[2-5] yet the TBS continues to enjoy good patronage in our society.

The long-established method of fracture treatment with the traditional splint is extensively practised throughout Nigeria as part of culture. The TBS is well patronised by the community, but officially the practice is not recognised as part of PHC in Nigeria. Despite criticisms and antagonism from modern medical practitioners, it has continued to thrive in secrecy, superstition and ignorance which has hindered progress in this area of traditional medicine.

The indigenous health services of which TBS practice is part rely on immediately available local resources. These services are community based. Indigenous systems of medicine do not limit themselves to fulfilling the needs of PHC, but also extend to specialised areas such as treatment of poisoning (snake bites), eye diseases and bone setting. Orthopaedic cases such as fractures, both open and closed, dislocations and sprains are common in rural areas. While a vast majority of cases requiring expert orthopaedic attention are being treated by the TBS in Nigeria, revitalising the existing TBS practice would be a cost-effective alternative to costly 'state of the art' techniques of surgical reduction and fixation. I believe that TBS practice could be modified and improved to make it appropriate in the management of carefully selected fracture cases. Although it is common knowledge that conservative treatment is not suitable for some fractures, the TBS would need to be educated to understand that in such cases internal fixation is the preferred treatment option. Interestingly, the traditional splint used by the TBS could be adapted as a functional brace for treatment of fracture of the shaft of the humerus.[1,4] The TBS uses a short splint on a closed fracture of the shaft of the humerus, maintaining that a little movement at the bone ends speeds healing. Recent scientific studies have proven this true. However, it would take education to convince the TBS that the same splint is not suitable for the treatment of a fracture of the neck of the femur and that the traditional splint and herbal treatment are not capable of healing every fracture. Remote control of the fracture healing process by the TBS is still not clear and may require further study. I was once told by a TBS that it would be difficult for me to understand the principles of remote control of fractures by the TBS, just as it is difficult for him to appreciate the scientific basis of electronic remote control devices. If the TBS remote control of fractures could be confirmed and used, it would be one area of breakthrough in the TBS treatment of fractures.

The astonishing thing in most TBS centres is that the chief physician is not a qualified physician from an institution but carries on the hereditary service of his ancestors. There is no prescribed fee pattern — each patient gives what he can afford as an offering. These centres therefore render invaluable service to the people in their communities, who are mostly villagers, farm workers and tree climbers who certainly cannot afford fracture treatment in a modern orthopaedic hospital.

Nigeria is not the only country with a tradition of bone setting. In 19th century England Hugh Owen Thomas was a bonesetter from Liverpool. He is still known as the father of orthopaedics in England. In India there has been a revival of interest in traditional bone setting practices. China also has a rich tradition in the healing art, and bone setting was practised by traditional Chinese healers. Recently the Chinese have made significant efforts to integrate traditional with modern methods in the treatment of fractures. In Nigeria today the only rational approach to self-reliance in health care is to strengthen and revitalise our indigenous systems of health care. We therefore need a revival of interest in TBS practice.

I believe that the TBS should be further trained and integrated into PHC delivery, especially in primary fracture care services. There is therefore a need to develop an educational model for the advancement of the TBS, services, and I recommend the following:

1. Researchers in our tertiary health institutions should collaborate to study the TBS perception of fracture management. Such study would allow for mutual exchange of ideas that would enhance the development of the TBS in our society.

2. Training of the TBS would be by informal education through apprenticeship.

3. TBS clinics would be designated Primary Fracture Centres (PFCs) in the communities. The services of the trained TBS would be backed up with a proper code of ethics and legislation. The PFC would be integrated with the officially recognised health service and health practitioners would be trained in the two systems of medicine.

4. **Mutual assessment**. There would be mutual assessment of TBS services using a participatory research approach to study the TBS's knowledge, attitude and practice of fracture management. Mutual appraisal of the findings would improve understanding and judgement on both sides, so that they can agree on changes that need to be made.

5. **Mutual adaptation**. The knowledge acquired from the mutual assessment of TBS practice would pave the way for mutual adaptation and modification of the traditional technology to improve fracture management in our community. The adaptation process would include practical methods of diagnosis, case selection, referral services, treatment options and rehabilitation, using means and languages that will be understood by all.

6. **Mutual training**. For successful integration of the TBS into PHC I advocate training of both the TBS and the orthodox health practitioner. The orthodox doctor would learn to appreciate the role of the TBS in primary fracture care in our communities. The strictly Western orientation of the modern medical profession has made interaction between the groups difficult. Western medical professionals would learn to appreciate the concept of the TBS services so as to help improve them. The TBS apprenticeship training workshops would include much-needed education on the basic principles of fracture management, basic hygiene and environmental sanitation. The informal training workshops would be broad-based, involving research experts from tertiary health institutions, TBSs, representatives from all tiers of government, community opinion leaders and representatives of donor agencies, with focus on the following areas: (*i*) TBS services — to define the scope, limitation and principles of TBS services; (*ii*) ethical considerations — to formulate a code of conduct for the TBS; (*iii*) formulation of policy — to enact enabling edicts or legislation for the TBS with government backing; and (*iv*) integration of the TBS into PHC — it is proposed that the national government would establish a Disability Control Programme (DCP) as one of the pillars of PHC, into which the TBS services would be incorporated to play a role in primary fracture care. It is visualised that the activities of the DCP would be co-ordinated at all levels of government from national to state to local, as shown in Fig. 7.

The TBS services would be integrated at the PFC level with the appropriate legislation. The NDCP directorate would develop research, education, training, and a campaign for public enlightenment about the role of the PFC in the basic management of fractures, using means and languages that would be understood by all, which would result in improved apprenticeship and mutual training.

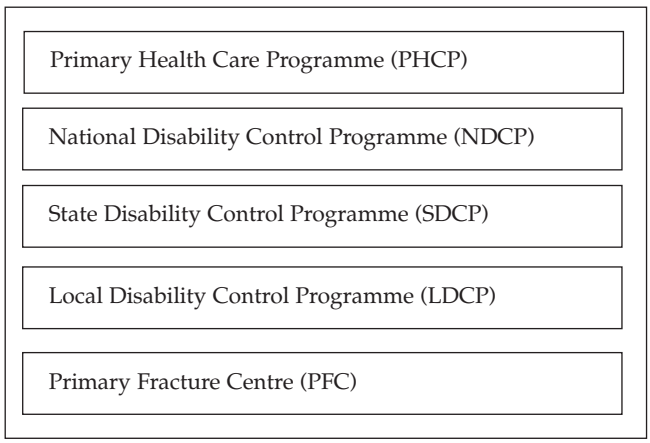

Fig. 7. The proposed scheme for the integration of TBS into PHC.

Conclusion

Education of the TBS in Nigeria is urgently needed. TBS services need to be evaluated, given due recognition and developed through research and training workshops so as to improve their safety and extend their application. Training and education requires an integrated approach. There is a need for multicentre research with each centre communicating its findings to the others so that the information can be summed up and specific objectives achieved.

The project would certainly need funding, which I believe should come from all tiers of government as well as donor agencies. Government should be involved in both orthodox and traditional medicine, in terms of funding as well as regulation.

Integration of the TBS with Western-trained health workers would offer a unique opportunity for the two to relate more closely to each other. It is hoped that such a functional working relationship would gradually replace professional antagonism and suspicion with mutual understanding and respect and ultimately improve patient care.

References

1. Oginni ML. The use of traditional fracture splint for bone setting. *Nig Med Pract* 1992; **24**(3): 39-51.
2. Onuminya JE, Obekpa PO, Ihezue HC, Ukegbu ND, Onabowale BO. Major amputation in Nigeria: A plea to educate traditional bone setters. *Trop Doct* 2000; **30:** 133 -135.
3. Onuminya J E, Onabowale BO, Obekpa PO, Ihezue CH. Traditional bone setter's gangrene. *Inter Orthop* (SICOT) 1999; **23:** 111 -112.
4. Eze CB. Limb gangrene in traditional orthopaedic (bone setters) practice and amputation at the NOHE — fact and fallacies. *Nig Med J* 1991; **21:** 125.
5. Offiaeli RO. Complication of methods of fracture treatment used by traditional healers: A report of three cases necessitating amputation at Ihiala, Nigeria. *Trop Doct* 1991; **21:** 182 -183.
6. World Health Organisation. *Traditional Birth Attendant. A Joint WHO/ UNFPA/ UNICEF Statement*. Geneva: WHO 1992.
7. Zoakah IA, Idoko OL. The performance of trained TBA in maternal health care services in two local government areas in Plateau State. *Nig Med Pract* 1997; **33** (3/4): 38-40.
8. Agaja SB. Internal fixation at ECWA Hospital, Egbe, Kogi State, Nigeria. *West Afr J Med* 2002; **21** (1): 40 -42.