Epilepsy, Neurocysticercosis And, Poverty At Mphumaze And Marhambeni Locations, In South Africa

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Citation

Abstract
Objective To determine the prevalence of epilepsy and to screening knowledge about neurocysticercosis (NCC) in adult population of two South Africa rural community.

Setting: Mphumaze is 2.4 k, away from Qumbu along the N2 road on the way to Kokstad. Qumbu is 56km away from Mthatha, the capital of the former Transkei.

Design: A two-stage design study was used. The first stage involved screening of the general population on door-to-door basis by interviewing peoples living in 100 household selected by block-randomisation procedure using an internationally validated questionnaire for detecting epilepsy and knowledge about some associated diseases. The second stage consisted of a neurological assessment of the peoples who screened positive.

Results: The prevalence of active epilepsy among adult population was 9.7/1000, and 14.7/1000 in children. Most of epileptic patients were not under regular anti-epileptic treatment, 91 % of the total population had not idea about NCC.

Conclusions: The prevalence of epilepsy is high compared with a similar community but a poor utilization of anti-epileptic treatment is cause for concern. Traditional belief's roots on this community are considerably deep. community diagnosis on epilepsy and neurocysticercosis at Mphumaze and Marhambeni was aimed at evaluating the health status of these two villages and to give an insight into the prevalence of epilepsy and neurocysticercosis (NCC) that the Qumbu Community at large was subjected to.

The prevalence of epilepsy and NCC were identified, accompanied by the risk factors that may have the cause of dominance of those diseases e.g. Sanitation, shelter, dietary habits etc. On the evaluation it became apparent that this community is of very low socio-economic status, the majority of the people is unemployed and the people depend on pension, thus the community as a whole is poverty stricken. A considerably large number of inhabitants were illiterate. The community lacked the fundamental necessities to ensure a better living e.g. water supply.

In conclusion the community was found to be susceptible to NCC and therefore prompt to epilepsy.

INTRODUCTION
Neurocysticercosis (NCC) is the most common cause of acquired epilepsy worldwide and most of the patients taking phenytoin or carbamazepine for a proper control of their seizures, respond very well. Other aspects related to NCC from our region are also available on line; this study was designed for Mphumaze and Marhambeni location which are situated at the former Transkei. This region was one of the three administrative authorities of the so-called independent homelands (Ciskei, Transkei and the Cape Provincial Administration under different apartheid governments) it is currently region D and E of Eastern Cape Province of South Africa; Mthatha is the capital for the former Transkei which is one of the poorest region countrywide, and serves as a labor reservoir for other wealthier provinces, with men leaving behind women and children whilst they seek and find employment elsewhere.

The main objective of this study is to determine the prevalence of epilepsy, and the knowledge about NCC and other epidemiological aspect from two of our rural locations at Qumbu municipality.
This area is plagued by a high rate of unemployment, low socio-economic level and poverty. It was the first time that these communities had been exposed to a study of this nature; a realistic approach was maintained while ensuring the highest level of privacy and confidentiality. A mutual relationship based on honesty and transparency was first established, so as to make the community open up and give truthful information that would give a true reflection of the Qumbu community.

BACKGROUND

South Africa is both first and third world country with a population of about 40 million of which 76% is black. Before 1994 Health services were fragmented along the racial lines, with the white population receiving First World Health care, while black people, especially in the homeland areas, received care below standard. Since 1994, the new democratic government identified, amongst its challenges, provision of equal services to all South Africans, as described by basic elements of Primary Health Care and Declaration of Alma-Ata.

Eastern Cape is one of the two poorest and three most populated provinces with a population of about 7 million individuals. Transkei is the least developed, mainly composed of rural areas and illiterate people. This area is not very good for farming as some years passed with nothing harvested because of droughts that limited both ploughing and survival of the livestock for economic purposes and direct consumption of the products-this is the picture that was obtained from the two populations studied. About 60% of this population is not economically active and most of the men from here earn their living by being migrant workers in bigger cities.

This is reflected in the rate of increase in HIV/AIDS in this vicinity in young adults and adults who are married and those in ‘steady’ relationships, because the men tend to have multiple partners away from home and come back to infect their wives.

MATERIAL AND METHOD

For this project, a team of 12 senior medical students from Walter Sisulu University in South Africa trained in the diagnosis of epilepsy and NCC were assigned to Mpumaze and Marambeni villages at Qumbu district, which is ~59 Km south to Mthatha and 35km north to Mount Frere. Latitude is 31,1500; longitude 28,8667; and altitude (feet) 2988(910m). These communities are 2.4 Km and 4 Km north of Qumbu respectively along the N2 highway. These communities are located in the former Transkei region of the Eastern Cape in Zone E which is currently known as Mhlontlo Municipality, in South Africa.

They implemented the questionnaire, the survey was made according to a World Health Organization. The Qumbu health centre offers primary health care services to other rural communities from this municipality, and two family doctors and 6 registered nurses staffed it at the prevalence day.

The training of the students consisted of a series of seminars, graphic bibliographic material and PBL (Problem Based Learning) tutorials about these topics. They administered a standard screening instrument for epilepsy, NCC, , and socio-economic living conditions. After to be introduced to the CHESP coordinator for the community, the group was divided into smaller group of two member each, where at least one was fluent in Xhosa (the native language). The survey was conducted between 12 and 16 hrs when most of the men would be out working therefore most of interviewed were women.

The study was outlined in two stages, and the investigation was door-to-door in a total of 100 houses selected by block-randomization procedure. First phase consisted in preparation, co-ordination through community’s leaders, training and data collection, and the second one for reassessment of identified candidates and processing of findings. Community diagnosis was the descriptive study of the Mpumaze and Marambeni villages. These two villages are located in Qumbu district under Mhlontlo municipality. They are also within the catchments area of Qumbu health centre. Those questionnaires were used in the quantity survey and were equally distributed amongst the two villages. In initiation of the community diagnosis the permission was obtained from the community leaders of the two villages Mpumaze and Marambeni.

The survey was conducted in isi-Xhosa (local language) although the questionnaire was in English because a lot of people did not understand English let alone speaking it. The investigation also included the sanitation, water availability, and people's understanding about neurocysticercosis. People were informed about certain diseases and their risk factors.

RESULTS

The results of the instrument showed a sensitivity of 89% (CI-94%, 83.7-95), specificity of 97% (CI-94,85-97). On
screening, the positive subjects found re-assessed by one of us. A number of inhabitants women twice fold than men.

On the basis of the definition proposed by the International League Against Epilepsy, we detected a prevalence of 9.7/1000 among adults and 14.7/1000 in children. Fifty six percent of the total group had active epilepsy on the prevalence day.

The mean age of age at onset was 17.7 years for motor partial epileptic seizures and 13.3 years for generalized seizures. More than 50% of the total population had some knowledge about epilepsy, but most of them interpreted epilepsy associated with some evil spirits.

**OCCUPATION**

**Figure 1**

Figure 1: Out of the adults that are in the communities visited 62% were unemployed because some were still in secondary and tertiary and also other were pensioners. The main reasons of unemployed are: - Most of the population and not in working age - Working people were not available to answer the Questionnaire. - They do not believe in self-employment.

![Occupation](image)

**AVerage Income**

**Figure 2**

Figure 2: Out of the 272 adults interviewed it has been observed that 46 of them earn between R0-R500, 34 people between R500-R1000 and 10 people over R5000. (Currency 1 USD = 7.6 Rands)

![Average Income](image)

It has been evident that there are high family sizes and this followed by overcrowding. The average income shows that most of these people who are overcrowded are the ones who are earning R0-R500 income; this proves that they have low socio-economic status. The low socio-economic status then results in poor nutrition, children being unable reach tertiary education and many other things that depend on money are lacking.

**MAIN RISK FACTORS AND HEALTH SERVICES**

**Lifestyle**

**Figure 3**

Figure 3: As part of the common lifestyle practices discovered in the Qumbu community, the following risk factors were identified with the prevalence of their occurrence as follows:

![Figure 3](image)

Obesity at the peak with 86% of the community falling in this category, followed by sedentary lifestyle at 80%, alcohol abuse at 71%, frequent smoking at 63%, family instability at 60% and drug abuse at 38%.

**ENVIRONMENT, SANITATION AND WATER**

**Water Source**

**Figure 4**

Figure 4: Main water source

![Figure 4](image)
Figure 5
Figure 5: The collected data indicated that the main source of water for the Qumbu community were rivers (used by 47%), followed by springs (used by 28%), then a supplement by rain water stored in inside home-built tanks (used by 19%), and the rest used dams, bought water, and tap water with the following distribution, 3%, 2%, and 1% respectively.

DISTANCE FROM WATER

Figure 6
Figure 6: Long distance to water source

Figure 7
Figure 7: People walked long distances to the various water sources mentioned above. From the prepared statistics, it was shown that 58% walked distances between 0-2 Km, while 22% walked distances between 2-4 Km and the remaining 20% walked distances between 4-6 Km.

WATER STORAGE AND SUPPLY

Figure 8
Figure 8: Water from water tanks (rain water)

Figure 9
Figure 9: Given the long distances that people had to walk to fetch water, the community had various storage facilities so as to avoid constant/daily visits to the natural sources of water. The survey reflected that about 61% of the people utilized buckets, with about 13% using tanks. About 26% were lacking water-storing capacity hence they had to fetch water daily from rivers.

CONSTANT WATER SUPPLY

Figure 10
Figure 10: As a result of the various challenges that were confronting the Qumbu community pertaining to water, it was thus deduced that about 82% of the people attested to lack a constant supply of water while only about 18% agreed to having a constant water supply, they have storage tanks at their backyards to store water in case of rainfall.

WATER PRE-TREATMENT (BOILING)
Figure 11: Evident from the data gathered was that water pre-treatment (e.g. boiling and home chlorination) was not executed by the entire community. This was reflected by 77% of people who attested that they did not pre-treat the water prior to consumption while only 23% indicated that their water was pre-treated.

Figure 12: Due to lack of modern sewage systems, the dominant type of toilet system was a pit latrine. About 94% of the visited houses had erected toilets within their yards. The other fraction of 6% did not have toilets hence shared with their neighbours or used the nearby veldt for defecation.

Figure 13: Further investigation was conducted to determine the number of people per household who shared a toilet. The obtained data reflected the following:

The group of (0-2) people that shared a toilet constituted 18%, followed by the group of (3-5) people who shared a toilet constituting 52%. The group of (6-8) people that shared a toilet formed 20% with the remaining 10% sharing a single toilet while being (9 and above).

Figure 14: During the house visits it was also part of the study to observe the toilet structures and conditions. The following were the observations made; about 72% of the toilets showed indications of unhygienic conditions while the other 28% were relatively clean and well managed thus lacking such indicators.

Figure 15: Upon being interviewed, as many as 77% confirmed that they consistently wash their hands. However another 23% confessed not to washing their hands after toilet use, and put water scarcity a major reason.

Figure 16: The main food preparation methods were boiling and frying (“braaing”) of food. The entire investigated community (100%) cooked their meals by means of boiling. In addition, about 45% were also frying their meals.
Figure 17
During the home visits, one of the tasks entrusted to students was to investigate the cooking area and food hygiene indicators. The following observations were made: about 47% of the population presented with poor food hygiene indicators. The other 53% showed no indicators of poor food hygiene indicators.

IRRIGATION OF INGESTIBLE VEGETABLES BY SEWAGE WATER
It was a challenge to assess the use of sewage water for irrigation since most of the people did not plough anything due to drought. However many families did not admit to using sewage water for irrigation.

Figure 18
The 10% of epileptic patients is attributable to a variety of causes, the majority idiopathic or of unknown cause, some as a result of traumatic events and most as a consequence of ingesting eggs of A large number of people in this community have no idea about the implications that could arise as a consequence of ingesting contaminated food and water and, a most of them do not keep their pigs inside pig-sties.

Figure 19
In the 10% of epileptic patients, a majority of them, (90%), are not on anti-epileptic medication and the remaining 10% is on irregular medication. Of the 10% of patients on medication, most are compliant with the treatment.

Figure 20
The 11% of patients that are not compliant could be explained by the fact that some of the patients stop taking their medication as soon as the symptoms subside.

Figure 21
The diagnosed epileptic patients are mostly diagnosed at the hospitals, about 60% of them, 30% are diagnosed at the health centres and 10% are diagnosed by traditional doctors. This is a true reflection that most people in this community do not regularly visit the health centres and most cases are not diagnosed at the first levels (the clinics), but are diagnosed at the second level (the hospital) when the signs and symptoms are severe.

Figure 22
A response of the epileptic patients is that the Qumbu Health Centre is well supplied with anti-epileptic medication, 60% of the sample population do not know the meaning of epilepsy and only 40% of them have an idea of what epilepsy really is.

COMMENTS
WATER
Water is the main resource required by all human kind for sustaining life. About 70% of the human body is constituted by water and many other essential human related functions are dependant on constant availability of clean water. In the Qumbu community this essential resource was scarce. The main sources of water were rivers followed by springs. A few houses have home-built tanks which collected water during rainy days.

Another very small fraction bought water from locals who in
turn obtained the water from town water taps using their cars and returned to sell to the community (R 20.00 per 50L). Women and children walked long distances (between 1-6 Km) to the respective sources of water hence many women complained of back and neck aches as they carried weights as large as 25 litres of water on their heads daily. A relatively high percentage of people did have proper storage practices of water mainly in the form of plastic buckets and tanks (for rain water).

However, about one forth did not have storage capacity hence the requirement for daily visits to the water sources. Also, due to state of poverty predominating in these families, people could not afford to buy chemicals for water pre-treatment or to buy fuels (gas, electricity) to boil the water. As a result two thirds of the community did not pre-treat the water prior consumption. In the light of all those challenges, it was understandable that about three quarters of the community did not have a constant clean and safe water supply therefore they are consuming contaminated water among them the prevalence of epilepsy was higher probable associated to NCC.

The other problem experienced by the community is clan-clashes. Local community leaders indicated that the provincial government/municipality previously organized with a particular civil engineering company to construct pipelines to transfer water from a river located within a distant neighbouring village to Qumbu. According to the plan, these pipelines were supposed to traverse through intermediate villages on their way to Qumbu. Two major obstacles were met. Eventually the civil company failed to continue with their work. Firstly, the intermediate villages did not give permission for water pipelines to pass through their villages to deliver water to other areas (Qumbu) while they themselves were having water problems. Secondly, due to tribal differences, the village where the river was located did not want to share “their water” with Qumbu.

FOOD PRACTICES
The principal energy foods were carbohydrates (provided in form of samp, mealies, etc.) and proteins (provided in form of beans and to a lesser extent meat). Majority of the population prefers pork meat, because is almost always available and cheaper. These foods were prepared through boiling and frying (or braai). With the latter method of preparation practiced by almost one half of the community - a concern was raised amongst the students about the suspected high probability of disease transmission mode associated with half cooked meat, e.g. Taeniosis (T. solium). At least two thirds of the community had evident good food storage capacity, in form of cupboards, bins (for unprepared/raw foods) and refrigerators. However about a one third lacked this storage capacity (especially for food cooked meals).This latter one third was predisposed to micro organisms associated with food poisoning. One could suspect that the frequency of unexpected diarrhoea in these families could be linked to these poor food storage practices. Poor food hygiene was a predominant finding.

SANITATION
Poor sanitary condition evidently existed in these communities. Toilets were mainly of the pit latrine type, most erected on iron corrugated steel by families themselves. The high percentage of families with pit latrines was attributed to the effort of voluntary health workers who made sure that every house had a toilet by constantly fining those who were reluctant to construct one. A very small fraction of the community did not have a toilet in their yard thus shared with their neighbours or defecated in the nearby bushes. Also discovered was that toilet sharing was common since as many as nine people shared a single toilet (sometimes from different families). Indications from the health community workers were that although some of the houses had well erected toilets, the latter were not in use.

One cited reason was linked to cultural tendencies where in certain families the daughter-in-laws could not share the same seat with the father-in-law. As a result these tendencies were also observed on the toilet seat. Furthermore, some families were said to have erected the complete toilet structure above the ground with the door without digging the hole. This was done to give the impression to enrooting health community/care workers that these particular houses had toilets thus avoiding being fined. Upon toilet inspection it was observed that about two thirds of toilets presented with poor toilet hygiene indicators like dirtiness, flies and mosquitoes, lacking proper structure like doors or lids to the toilet seats. There were limitations patterning to the assessment of the use of sewage water for irrigation of ingestible plants and vegetables. The reason was that many people did not plough this year due to drought. As a result it could not be exclusively said with certainty that sewage water was not used for irrigation.

Furthermore, about one third of the people confessed that they did not regularly wash their hands due to water unavailability. The faecal-oral mode was expected to play a
major role in the transmission of communicable diseases. Toilets were changed as often as twice per year. In some families medication to bio-digest the excreta was applied inside the pit thus lowering the excreta level and this prolonged the duration of toilet use.

The voluntary health workers (onomakhaya) had tried to increase awareness about health education. The major limitation was the disproportion that existed between the limited number of available health community workers and large village communities they had to serve. Also the health community workers were expected to cover large distance on foot sometime during adverse weather conditions.

**EPILEPSY, NEUROCYSTICERCOSIS, AND POVERTY**

In the survey that was conducted on the sample population, 9.7/1000 of adult population were found to be epileptic, of this number, 30% had been diagnosed in less than a year, 1% had been diagnosed in the period of the past 1-3 years back and 69% had been diagnosed for more than 5 years back, showing that most of the known patients are chronic epileptics with no well controlled epileptic seizures. Most of epileptic patients have an associated NCC as a cause of epilepsy and NCC is directly related with poor socio-economic condition, poor sanitation and lack of clean and safe water. The poor socio-economic status of community was arrived at based on the fact that most of the people earn a very low income and yet the sizes of the families are very large, thus reflecting that they cannot sustain viable and sufficient needs. The majority of the people in this community do not have adequate education because they have school early and are then unable to get proper jobs, this on its own leads to high levels of unemployment. Also evident form this community was a large number of grandchildren who depended on their grandparent's pension for food, education and clothing. The type of food that these children ate (e.g. samp everyday) showed that the families depended on whatever little the grandparents could offer. A high rate of pregnancies was also another contributing factor, showing that the majority of women fell pregnant just to get child support grant which is far less to satisfy their needs. Majority of people earn a living from low-paying jobs like being a gardener. Surprisingly some women to clinic in order to test and be diagnosed HIV positive so that they would be able to get the grant received by HIV patients. The money is intended to support the family and not to get proper treatment and nutrition.

Lack of good sanitation and scarcity of water led to high infections, also people used the same source of water from which their livestock drank and they did not pre-treat their water before drinking. And to conserve water people ignored to practise hand washing before meals. In most of the families, crowding in their houses led to the high rates of infections.

High rates of unemployment in Qumbu as already mentioned is located in rural Transkei. As a result of this the area is already too predisposed to poverty since in this region and the Eastern Cape poverty is endemic condition. It was found that in this region there is high rate of unemployment. Furthermore the land is harsh and infertile therefore there is little potential for commercial production of vegetables and their sale. Most people in this region if they do plant vegetables it's only for subsistence farming that is to provide food for their families. The people who do farm their own cattle, sheep, goats etc., these are the few lucky members of the community because most of the people cannot afford to maintain their livestock in a healthy condition. People who do farm livestock don't change grazing fields and as a result the land becomes unsuitable for grazing.

The high rate of unemployment plays a role in many other factors and family stability. For example people come and seek medical assistance at the health centre but when they are referred to Nelson Mandela Academic Hospital, most of them cannot afford to go to the hospital and end up going to hospital when their condition becomes serious. Most families have their composition because of their high rate of unemployment. Young adults and people of economically viable age leave Qumbu in search of a better life going to the “City of Gold” Johannesburg and Cape Town, only to return, jobless with children or either HIV positive and sick.

Poor provision of services by the municipality: The municipality had the difficult task of providing services to the vast area of Qumbu. It’s difficult when you consider the fact that the area has no formal infrastructure therefore services such as refuse collection, water and electricity become limited to the town area itself therefore, the municipality is affected by the residual effects of our past. Manin conclusion of this investigation is: Epilepsy, NCC and poverty are strongly inter-related and to eliminate one is mandatory to eliminate the other one.

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