Neuroepidemiology Findings As Contributors For Epilepsy Due To Neurocysticercosis At Mngceleni Location, South Africa

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Abstract
Introduction: Eighty two people were interviewed in the Mngceleni area. The survey involved the general information about the community’s demographics, living environment, and health status, but mainly about neurocysticercosis and epilepsy.

Aim: To perform a research in the Mngceleni area to evaluate the prevalence and knowledge about neurocysticercosis and epilepsy.

Methodology: A group of 14 students conducted a descriptive study of the community, using a random sample survey (Appendix 1) of 82 households.

Results: The prevalence of epilepsy and neurocysticercosis was found to be 6% and 4% respectively. While only 3% of the population had a good knowledge for both the diseases.

Conclusion: The high prevalence of both the diseases were attributed to poor sanitation and living standards, as well as a lack of education. The research revealed a need to build toilets, to educate the people about these diseases and about the major risk factors present.

INTRODUCTION
Following the Community Based Education and Service (COBES) system of the Walter Sisulu University, the students set out on a research of the Mngceleni area, which is located in Sidwadweni. This community consists of approximately 3000 people, whom are served by Mhlakulo Health Centre for their medical attention.

The COBES system has been created in order to introduce to students to the community and to motivate them into helping the people of these communities. Based on the community and the people of the community, students are able to get a unique insight on the living conditions and health status, which opens gateways to offer help and find solutions to their difficulties.

The research that took place involved finding out general information about the community, such as their housing, occupation, health status, financial status, hygiene and demographics. The specific task at hand was to find out about the communities knowledge and health status on epilepsy and neurocysticercosis (NCC).

Neurocysticercosis is a parasitic infection of the CNS caused by the larval stage of Taenia solium, the pig tape worm. This is the most common helminth to produce CNS infection in humans. NCC may remain asymptomatic for months too years and sometimes its diagnosis is made incidentally when neuroimaging is performed.

NCC is the most common cause of epilepsy in the developing world. Most patients are administered phenytoin.
Neuroepidemiology Findings As Contributors For Epilepsy Due To Neurocysticercosis At Mngceleni Location, South Africa

or carbamazepine, which effectively controls their seizures.

It is important to inform the people that NCC can be PREVENTED! With proper sanitation and food cooking, there's no need to fear the disease.

Signs and symptoms are related both to the parasite and to the inflammatory immunological response of the host. Typical manifestations are subcutaneous cyst presenting as nodules that tend to be asymptomatic. The natural history of the infection is unknown, but it is known that cysticercus's complete there development within two to four months after the larval entry. Location of infestation, according to frequency, is the CNS; subcutaneous tissues; striated muscle, eyeball, heart and then other tissues. The may remain alive in these locations from months up to years.

Human cysticercosis is acquired after eating food contaminated with fertilized eggs excreted in the faeces from taenia carriers. It is well known that people eating infected pork meat acquire TAENIASIS as opposed to CYSTICERCOSIS. The latter is acquired from Taenia solium eggs, that auto-infect patients that are harbouring the adult parasite in their intestines. The cysts can develop anywhere, but have a predilection for the CNS.

Factors that contribute to the high prevalence in the Eastern Cape include free range farming, unsanitary toilet facilities, use of Taenia solium segments by self taught healers (to heal worm infestations) and also malevolent use of Taenia solium by angry women to punish unfaithful partners (added to beer).

Epilepsy is a chronic condition/illness that is characterised by attacks of seizures that vary from simple partial seizures to strong generalized seizures. The cause of epilepsy is often not found, but common causes are cysticercosis, trauma to the head, stroke, vascular malformations and alcohol or benzodiazepine withdrawal.

Living with epilepsy creates many problems, such as inability to drive or to operate machinery; therefore many patients cannot work and earn a living. Another problem is that patients live with a constant fear, fear of when their next seizure will be or of sudden death. There is also a psychosocial aspect if living with epilepsy, for example the impact that the disease will have on the individual's family. They will be on alert all the time, worrying about the patient's well being, or the nagging stress about whether or not the patient has taken their medication for today.

Patients are only administered drugs for epilepsy if there is proof (eye witness) of more than one seizure/fit. However, if the patient only has about one seizure every two years, then it should be discussed with the patient that they may want to deal with the risk rather than taking drugs every day, particularly if the patient has no need to drive or operate machinery.

Drugs used for the treatment of epilepsy are carbamazepine; sodium valproate and phenytoin.

AIM
To evaluate the prevalence and the knowledge base of epilepsy and neurocysticercosis.

OBJECTIVES
- To analyse the effect that these diseases have on the community
- To know about other epidemiological aspects and risk factors (water, sanitation, lifestyle) that can affect the health of the community.
- To form, submit and discuss a comprehensive report of the results to the District Health and the provincial DOH.
- To promote health education and disease prevention
- To make recommendations if any problems are identified

METHODOLOGY
A group of 14 students from Walter Sisulu University (WSU) of the medical faculty were assigned to Mhlakulo Health Centre. Under the supervision of Community Medicine, the students conducted a descriptive study of the Mngceleni community. With the community leaders permission, the students investigated by conducting a random sample survey (Refer to Appendix 1), door to door. Eighty two households were interviewed using the questionnaire formulated by the faculty.

All the objectives of the research and the questionnaires were checked by and given the go-ahead by the students, matrons of the health centre and the community leader. Also the CHESP members were informed about this research project. The community leader and matrons agreed to help the students with there study and compilation of there
important learning activity. The students were taken into the community by transport provided by WSU.

The questionnaire included specific questions related to epilepsy, neurocysticercosis and other indicators (demographics, lifestyle, sanitation and environmental factors). [Appendix 1 is a sample of the questionnaire]

During the interviews, the students interacted with the population (health promotion), explaining the main risk factors and preventative measures for diseases. This included explaining the Taenia solium life cycle and the importance of well-cooked pork. Language barriers were taken into account for the interview and for the informed consent, therefore the interview was conducted in the native language, isiXhosa.

Afterwards, the results were graphically represented, analysed and interpreted. Links were found between lifestyle, habits, knowledge, environment and the diseases.

Finally, this report was compiled using Microsoft word and excel. Added information was obtained from the internet and text books, referred to in the bibliography. The presentation will be done using Microsoft Power Point.

DEFINITION OF TERMS
COBES - Community Based Education and Service
Community - The people living in the same area, or a group of people with similar interests or origins
Epilepsy – A disorder of brain function characterized by recurrent seizures that have a sudden onset
Health Centre – A building, owned or leased by a community trust or a Health Authority, that houses personnel and/or services from one or several sections of the National Health Service. Services provided by local authorities, such as social services, may also operate from such a centre
Incidence Rate – A measure of morbidity based on the number of new episodes of illness arising in a population over a period of time
Neurocysticercosis – A disease caused by the presence of tapeworm larvae, of the species Taenia solium, in the brain. Where they cause symptoms of mental deterioration, epileptic attacks, convulsions, paralysis and giddiness
Population – A group of living things of the same type living in the same area, inhabitants
Prevalence Rate – A measure of morbidity based on current sickness in a population, estimated either at a particular time or over a stated period
Survey – A general look at something.

LOCATION
Mhlakulo Health Centre is located 30km east of Mthatha on the N2, in the Eastern Cape Province. Mngceleni is the area next to the health centre.

RESULTS AND DISCUSSION

Figure 1
Graphic 1: Demographics of adults in the community

From this representation of the males and females, it is evident that there are much more females than males in this population. The major reason for this is that the males leave the community to find jobs elsewhere. By emigrating for work, they are able to support their families at home.

Figure 2
Graph 2: Percentage of children in the different age groups
Demographics: Children (below age 16 years)

In this analytical representation of the children from the households interviewed, it was found that majority of them are over the age of six years (50.8%). 37.5% of the children are between the ages of one and five years and 11.7% of them are below one year.

**Figure 3**
Graphic 3: Education level of the people interviewed in the community

From the eighty two people interviewed, 14% were completely illiterate, which means that they have not been to school at all.

30% of them completed primary school, 46% completed high school and only 10% completed university.

The main reason for the low levels of education is due to the lack of funds and motivation. Mngeleni is a poor community, where the vast majority cannot afford to send their children to school, but rather have them stay at home and help their parents with household chores. Most of the children don’t have the motivation to pursue further education and careers. It seems that succeeding at university and pursuing a career is something far fetched. This results in a lack of drive to work hard and complete university, which results in the low education levels in the community.

**Figure 4**
Graphic 4: Household income per month

The major source of income in the community is the pension fund received by the elderly of the household, which is R870, therefore the highest income is in the range of R500 – R1000 (52.4%).

21.2% of the households earn above R1500 per month, and 21.2% earning below R500 per month.

One of the reasons that results in the low income is the low education level that the community has, which means that the people work for low paying jobs. The social grant that single mothers receive also contributes to the high percentage of households earning below R500 per month.

Households receiving over R1500 are mainly due to family members, specifically the men, working away from home. For example, men working in Johannesburg as factory workers send money home to their families. Also interviewed were teachers, which contribute to the 21.2% of the community that earns above R1500 per month.

The last group of people earn between R1000 and R1500 per month, which is 5.2% of the population. These people have jobs such as shop attendants and cleaners.
The standard of living is satisfactory in this community because most houses are made of bricks, 56.8%. Rondavels formed the second most popular type of housing, at 28.4%. The least popular are the cement brick structures at 14.8%. These cement bricks are actually made by the people of the community.

The major risk factors that predispose this community to ill health are smoking, alcohol consumption and obesity. 38% of the interviewees indulge in smoking, which leads to respiratory system problems mainly, but is also a risk factor for many other ailments such as hypertension and cancer.

36% of these community members consume alcohol. Alcohol is rarely enjoyed in moderation, and in excess, proves to be a great problem in society. Alcohol abuse not only causes direct harm to body organs and functions, but also inhibits the sense of judgement. This is what leads to many fights and trauma wounds, rape and motor vehicle accidents.

Lastly surveyed was obesity as a risk factor, and it was found that 26% of the interviewees are obese. Obesity is a major risk factor for atherosclerosis and diabetes mellitus.

The entire community has access to community taps, which are situated along the road that goes through the community. There are times however, when there are water cuts and the community members have to find an alternate source of water. This is when 62% of the people obtain water from the river and 38% obtain water from water tanks. The water obtained from the tanks and the river is boiled by the people before consumption.

Availability of tap water decreases the risk of infectious diseases, including neurocysticercosis.
remaining 98% of the population, 65% uses the long drop method and 33% makes use of fields.

This is a major sanitation problem in this community and is a source for the spread of infectious diseases. Making use of a field for defecation means that there is contamination of river water that is used drinking and contamination of vegetables grown by families for food by bacteria and parasites, specifically Taenia solium.

**Figure 9**
Graphic 9: Main illnesses that the community people suffer with

The main illness that this community suffers from is hypertension, with the prevalence being 33%. This is followed by asthma at 14%, tuberculosis and HIV at 11% and epilepsy and the common cold at 10%. The less common illnesses were diabetes mellitus prevailing at 5%, arthritis at 4% and skin diseases at 2%.

Hypertension is the highest because of the multiple risk factors that are present in this community, namely obesity, smoking, alcohol abuse and the black race.

Asthma being second highest is partly due to the persistent inhalation of the indoor smoke pollution formed by cooking using wood and fire inside rondavels.

HIV prevails at 11%, and so does TB, which indicates that the high prevalence of TB could be occurring as an opportunistic infection in the immunocompromised individual.

It is evident that the 10% of the community that has epilepsy, 4% is due to neurocysticercosis and the remaining 6% could be due to excessive prolonged alcohol abuse or idiopathic.

The common cold seems to be high in this community, but taking into consideration that this research was done in the “flu-season” (winter) gives a greater understanding.

**LIMITATIONS**
Since the information obtained relies entirely on the verbal recollection of the interviewees, the results could be slightly inaccurate, because the information received may not be all true.

Certain members of the community were reluctant to participate in the survey, partly because they saw no benefit to them. This made collecting the data difficult for the interviewers.

The stigma attached to epilepsy, i.e. witchcraft, lead to some members lying about their health status during the survey, which also resulted in inaccurate data collection.

Due to the survey being done during working hours of the day, some households were empty because residents were at school or work.

Some houses were inaccessible due to aggressive dogs being present.

People should be educated more and there should be more health promotion for epilepsy and neurocysticercosis, because it was found that there is a lack of knowledge. This lack of knowledge causes the individual to not seek the proper health care needed, but also leads to improper beliefs and stigmata attached to those who suffer from these ailments.

**RECOMENDATIONS**
Toilets should be built in the community, to prevent the infectious diseases that are caused by poor sanitary conditions.

Health promotion on hygiene and sanitation should be improved, which will reduce the incidence if infectious diseases.

**ACKNOWLEDGEMENT**
To our group members for their cooperation and hard work.
Figure 10

References

1. http://www.uninet.edu/cimc2001/communication
7. The internet journal of infectious diseases
8. Mbekweni 2005 WSU COBES report
9. Mhlakulo 2006 WSU COBES report
11. Oxford Medical Dictionary
12. Kumar and Clark Clinical Medicine
13. Murray Rosenthal Kobayashi Pfaller - Medical Microbiology
14. Resource Lecture - Dr. Vivek Bhat
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