CASE REPORT

Factors affecting illness in the developing world: chronic disease, mental health and traditional medicine cures

Nathan T Douthit,¹ Hailemariam Alemu Astatk²

¹Ben Gurion University, Medical School for International Health, Be'er Sheva, Israel

²Department of Internal Medicine, University of Gondar, Gondar, Amhara, Ethiopia

Correspondence to
Dr Nathan T Douthit,
ntdouthit@gmail.com

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SUMMARY

This is a case report of a 24-year-old Ethiopian woman with a medical history of hepatosplenic schistosomiasis. She suffers from chronic liver failure and portal hypertension. She has been hospitalised for 'hysteria' in the past but did not receive follow-up, outpatient treatment or psychiatric evaluation. After discontinuing her medications and leaving her family to use holy water, a religious medicine used by many Ethiopians, she was found at a nearby monastery. She was non-communicative and difficult to arouse. The patient was rushed to nearby University of Gondar Hospital where she received treatment for hepatic encephalopathy and spontaneous bacterial peritonitis. Her illness is the result of neglected tropical disease, reliance on traditional medicine as opposed to biomedical services and the poor state of psychiatric care in the developing world.

CASE PRESENTATION

The patient is a 24-year-old Ethiopian woman from a small rural town on the shores of lake Tana. She and her family are subsistence farmers. She is still a student, as it is not uncommon for children in Ethiopia to start school late in their adolescence. She was diagnosed with chronic liver disease and portal hypertension secondary to hepatosplenic schistosomiasis for over 5 years. The diagnosis was made by ultrasound scan showing periportal fibrosis with normal liver parenchyma following exposure to *Schistosoma mansoni*, which is endemic in lake Tana. The family was educated to understand the patient's illness, and she followed up with the doctors at University of Gondar Hospital regularly since she did not have access to a physician in her town. She was managed with furosemide, spironolactone and propranolol. She was compliant with her medications and did not miss her follow-up appointments, where her medication was adjusted according to her needs. The patient functioned normally at baseline, and did not have any issues with daily life due to her illness. Two years ago, the patient was admitted to the hospital with left hemiplegia, tremor and difficulty in communicating. She was admitted to University of Gondar Hospital and worked up for possible hepatic encephalopathy. No organic cause was found following investigation with normal test results, and the diagnosis recorded on discharge was 'hysteria'. She was treated with clonazepam and it was documented that she was 'linked' with a psychiatrist. When asked, her family remembered the hospitalisation, and remembered

that there was no organic cause found. They denied ever being told that she needed to pursue psychiatric care, and they have no knowledge of the patient ever pursuing the said care. They said when she left the hospital in <48 hours she was feeling and behaving normally so they thought the medications she was administered had resulted in her returning to baseline. She returned home, and from that point onwards continued her medications and follow-up regularly. She lived with her parents due to her chronic illness. She was well adjusted and had friends. She struggled in school, but managed to pass her classes. There were no further episodes like the one 2 years prior.

Six weeks prior to presentation, the patient failed out of school. She became intensely depressed, with her family reporting that she slept continuously, would not interact with them and rarely left her bed. She continued taking her medications during this time. After ~1 week, she became agitated and aggressive, yelling and physically threatening her family. They say she had never acted like this before. After a few days, she left her home against her family's wishes and without their knowledge. Her family had no idea where she was. She did not take her medication with her. Four weeks later, some friends called the family. They had been visiting a monastery nearby, and their daughter reportedly had been there. She was extremely ill and could not be aroused. The family rushed to the monastery, and deduced that the patient had hiked 4 hours to the monastery in order to treat her illness through a traditional Ethiopian religious cure, that of drinking holy water. Patients often use it along with their medical treatment. It can be found at certain churches and monasteries throughout the country, and patients will bathe in it or drink it for blessing and subsequent cure from disease. Although the patient and her family were religious members of the Ethiopian Orthodox Church, they had never considered or discussed pursuing holy water as a cure. The patient had never mentioned a desire to pursue it. They were shocked to find she had abandoned her conventional medicines for this choice. Seeing the patient in her state, the family rushed her to a nearby medical centre. They said the doctors there took one look, did not examine the patient, but instantly referred them to University of Gondar Hospital. In the process of arriving to the emergency department (ED), the patient had three episodes of tonic-clonic seizures. She arrived to the

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ED with her mother and brother who related the history to the doctors there.

On arrival, her blood pressure was 120/80 mm Hg, pulse rate was 112 beats per minute, respiratory rate was 22 breaths per minute and temperature was 37°C. She was saturating at 97% on room air. She had non-icteric sclera. Dried blood was noted on her teeth and the inside of her mouth. On auscultation, there were diffuse crackles and transmitted sounds bilaterally. Her abdomen was tender, tense and distended. Hepatosplenomegaly was noted. Her Glasgow Coma Scale (GCS) was 7 (E2, V1, M4). Her tone was decreased and her deep tendon reflexes were exaggerated at three of four. She had generalised oedema that was especially noted on the face and legs. Investigations included complete blood count, blood chemistry, liver function tests, urinalysis and pericentesis. Her blood glucose was 77 mg/dL; white cell count (WCC) was 23.9×10^3 with 84.6% neutrophils. Her urinalysis showed +1 blood, many red blood cell and WCC/high powered field (hpf) and was leucocyte esterase positive. Her electrolytes were abnormal: potassium (3.29 mmol/L), sodium (120.4 mmol/L). Also, her aspartate transaminase (AST) was 161 µ/L, alanine transaminase (ALT) was 72 µ/L, blood urea nitrogen (BUN) was 72 mg/dL and creatinine was 1.8 mg/dL. At a routine follow-up last year, AST was 94 µ/L, ALT was 66 µ/L and creatinine was 0.94 mg/dL. Pericentesis was performed with no organisms seen. The cell count from the fluid revealed 200 cells/µL with 80% lymphocytes and 20% neutrophils. The patient tested negative for HIV, hepatitis B and hepatitis C. Brain imaging was not performed as a metabolic cause was considered the most likely source of the coma. EEG was unavailable at the hospital.

The differential diagnosis included spontaneous bacterial peritonitis (SBP), severe acute malaria, acute pyogenic meningitis, status epilepticus and viral meningoencephalitis. Once she regained consciousness, cerebrospinal fluid (CSF) analysis was performed and there was no evidence of infection. The patient had no history of epilepsy and her gross ascites indicated a metabolic cause for her altered mental status. The clinical picture was extremely suggestive of SBP. Despite the low cell count the clinical picture indicated this to be the most likely cause.

For treatment, the patient was put on nasogastric tube (NG) tube feeding and water was restricted. She was given intravenous ceftriaxone and metronidazole for suspected SBP. Lactulose was not available for treatment of the patient's hepatic encephalopathy. Bisacodyl was given to increase the patient's bowel movements. She was supplemented with 40 mmol of potassium chloride (KCL) and given serial neurological evaluations.

Initially, the patient did not improve with treatment. After 72 hours, however, her GCS score began to improve. With continued care and support the patient made a full recovery and was discharged after 14 days. She was discharged with continued follow-up for her chronic liver disease and the still standing recommendation that she receive a psychiatric evaluation as soon as possible.

GLOBAL HEALTH PROBLEM LIST

This patient's illness is complicated by:

- ▶ Long-term sequelae of neglected tropical disease;
- ▶ Reliance on traditional healing arts in lieu of medical care;
- ▶ The status of psychiatric care in the developing world.

GLOBAL HEALTH PROBLEM ANALYSIS

Long-term sequelae of neglected tropical disease

Neglected tropical diseases (NTDs) afflict over 1 billion of the world's population.¹ This population is already vulnerable and

lives in intense poverty and geographic isolation. They are most likely to be found where there are many conflicts and human rights violations.² Over 500 000 of this population die annually from NTDs, and they account for a quarter of the disability-adjusted life years from HIV/AIDS and almost the same burden as malaria. These diseases exert social impact due to lost educational and economic potential as well as stigma.^{3 4} NTDs can be controlled, however, with appropriate tools which include preventive chemotherapy, intensified management, vector and intermediate host control, veterinary public health at the human animal interface and provision of safe water, sanitation and hygiene.^{1 5}

The life cycle of *Schistosoma* can be seen in figure 1.⁶ This disease is acquired in endemic areas by bathing in a freshwater pool. The cercariae of the parasite penetrate through the skin, and migrate via the venous system through the lungs and heart to the liver, where they mature and pair off with a mate.⁷ About 50% of eggs ulcerate through the walls of the bladder or bowel and are excreted. These hatch into miracidia that infect freshwater snails, the intermediate hosts. The other 50% of eggs remain trapped in host tissues and are attacked by cell-mediated immunity. This process results in inflammation, fibrosis and organ dysfunction.⁸ In 90% of patients with a low worm burden, this infestation does not result in organ dysfunction. If there is a high worm burden, however, it can result in portal vein fibrosis, portal hypertension and chronic liver disease.⁹ This in turn can lead to glomerulonephritis (related to immune complexes), pulmonary hypertension and cases of hepatic encephalopathy due to shunting.¹⁰ It has been shown that *Schistosoma* infection can result in up to 24% disability.¹¹

Fortunately, this disease is largely manageable through treatment with medical therapy (praziquantel has a cure rate of 75–100% and other promising drugs are available) and prevention via education, filtering, preventive chemotherapy and control of the intermediate host.¹² Clinical trials of vaccination are also underway.¹³ With respect to this and other neglected tropical disease, a rapid-impact package consisting of four of six high-yield drugs, albendazole or mebendazole, praziquantel, ivermectin or diethylcarbamazepine and azithromycin, has been developed. These impact seven of the most common NTDs including soil transmitted helminthes, schistosomiasis, lymphatic filariasis, onchocerciasis and trachoma. These drugs are being provided by donation from pharmaceutical companies. The programme for using this package is estimated to cost between 40 and 80 cents per person in sub-Saharan Africa.¹⁴

Schistosomiasis is still neglected largely due to the low socio-economic status of their victims, the conflict in their regions and being overshadowed and underfunded by attention paid to 'the big three' of malaria, tuberculosis (TB) and HIV/AIDS.^{3 4} They are the reason that the world's poorest, 'cannot escape destitution and despair'.² Despite the promising advances in control, over 5 million Ethiopians are infected with schistosomiasis and 37.5 million more are at risk.¹⁵ Prevalence among elementary school children in Gorgora on the shores of lake Tana is 20.6% and higher at other locations throughout the country.¹⁶ The cause of this prevalence is linked to lack of research about the disease mapping and transmission, public health education, infrastructure and sanitation.^{15 16} As of 2012, Ethiopia, Nigeria, Democratic Republic of the Congo and Tanzania contained 60% of the world's vulnerable populations.¹⁷ Ethiopia, however, committed in 2012 to mapping the distribution of schistosomiasis in the area and in 2015 began an initiative for deworming the most vulnerable populations.^{18 19} These efforts were made possible through collaborations with

Figure 1 Schistosoma life cycle reproduced with permission from CDC-DPDx. CDC, Center for Disease Control-Division of Parasitic Diseases and Malaria. *S. haematobium*, *Schistosoma haematobium*; *S. japonicum*, *Schistosoma japonicum*; *S. mansoni*, *Schistosoma mansoni*.

the WHO, private donors and other non-governmental organisations.²⁰ In order to be successful, the political will for disease control must be sustained, the operations must be scaled up, the partnership between governmental and non-governmental organisations needs to be strengthened, and national institutional capacity must be strengthened.^{8 14 17 21}

This can be seen in China's success in controlling endemic schistosomiasis. In the 1950s, schistosomiasis was estimated to effect 11.6 million people throughout China. In 2011 that number had decreased to <300 000 people in seven zones. China invested in research, sanitation, snail control and agricultural regulation to prevent transmission with excellent results. They now have elimination in their sights, with a goal to interrupt transmission by 2020.²¹

Reliance on traditional healing in lieu of medical care

The use of 'holy water', water that has been blessed by clergy that can be acquired at monasteries, churches or other holy sites throughout the country, is a common traditional practice in Ethiopia.²² These and other treatments fall under the term traditional medicine, which is 'the sum total of the knowledge, skill, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental

illness'.²³ Many people depend on traditional medicine worldwide; this is largely due to better access than conventional medicine in the developing world; in Africa the ratio of traditional healers to populations is significantly higher than that of medical practitioners (1:500 compared to 1:40 000 respectively).²⁴ Traditional medicine is used in Uganda and Tanzania by 60% of the population, in Benin and Rwanda by 70% and in Ethiopia by 90%.²⁵ It has also been found that culturally people turn to traditional medicine for conditions that fail to respond to conventional treatment, stigmatising conditions, health conditions thought to have supernatural origin and psychiatric disorders.^{26–30} These are not the only areas where traditional medicine is used; however, in Ghana, Mali, Nigeria and Zambia 60% of children with high malarial fever receive traditional medicine as first-line treatment and difficulty accessing care and poverty can lead patients with TB to delay presentation to biomedical care in the developing world.^{31 32}

This reliance on traditional healing in lieu of biomedical care can carry dangerous outcomes for patients that include toxicity, delayed presentation to biomedical services and dangerous drug interactions.^{32–36} However, the fact remains that because the majority of developing world populations does not have access to biomedical services traditional medicine is their only choice.^{25 37} In recent years, efforts have been made to ensure the regulation of traditional medicine, and care has been taken

to attempt to integrate those practitioners into national health-care systems.²³ These traditional medicine practitioners can screen for serious disease, refer to biomedical care and help deal with the psychosocial effects of illness.^{23 24 33} In the case of these underserved populations, especially those who live in rural areas, biomedical healthcare providers must be able to conduct a respectful discussion with traditional medicine providers, and those providers must be able to realise when a patient would most benefit from conventional services.^{23 24 38} This patient reinforces the need for a partnership in planning, education and dialogue between biomedical services and traditional medicine.^{23 24 33 38}

The status of psychiatric care in the developing world

It is likely in the above case that mental health disorder plays a role. The abrupt personality changes, the history of 'hysteria' with no organic cause found and the depression indicate that psychiatric illness could be affecting the patient's decisions. In Ethiopia, with a population of over 90 million, there is only one hospital dedicated to mental health and this facility only has 268 beds. The number of staff working in other mental health facilities is 1.2 per 100 000. The number of psychiatrists is 0.2 per 100 000, but rural areas are extremely underserved as the number is 0.5/100 000 in urban populations.²² Only 1.7% of the total national health expenditure was directed towards mental health, and 83% of that spending was directed towards the lone mental health hospital.³⁹ This problem is not unique to Ethiopia. Depression has been found to represent as large a disease burden as malaria in low-income countries (3.2% compared to 4.0%), yet funding for malaria far outstrips that dedicated to depression.⁴⁰ The economic burden associated with mental health exceeds that of cancer, chronic respiratory disease, cardiovascular disease and diabetes, and the combined burden of mental health and behavioural disorders' impact on years lived with disability is higher than that of any other disease category at 22.7%. Despite this disease burden, more than 75% of people living in developing countries with serious mental illness do not receive treatment.⁴¹ One-third of developing countries do not have a budget for mental health services, and a further one-fifth of countries have a budget of <1% of their total dedicated to mental health services.⁴² The extreme deficiency of psychiatrists is particularly evident in Liberia (1 psychiatrist for 3.5 million people), Chad (1 psychiatrist for 9 million people), Eritrea (1 psychiatrist for 4 million), Afghanistan (2 psychiatrists for 25 million), Rwanda (2 psychiatrists for 8.5 million) and Togo (2 psychiatrists for 5 million). This lack of care for mental health patients in developing countries makes them a particularly vulnerable population. Patients in need of mental health services face serious stigma and can be subject to violence and abuse, experience restrictions in civil and political rights, not be granted full societal access, lack access to health, social and emergency relief services, lack educational opportunity and have poor educational outcomes, be denied economic opportunity, experience substantial disability and premature death.⁴²⁻⁴⁴

It has been pointed out that investing in mental health services is 'a matter of cost-effectiveness, social justice, and even a smart development strategy'.⁴¹ It has been recommended that the developed world help provide mental health leadership by training and developing global mental health psychiatrists, psychologists, social workers, clinical nurse specialists and training for emergency and primary caregivers.⁴⁵ An example of this can be found in Ethiopia. Although deficiencies remain, psychiatry training has been greatly improved by a partnership between the

University of Toronto and Addis Ababa University. The Toronto Addis Ababa Psychiatry project has resulted in 22 trips of psychiatric faculty and residents to assist in the training of 30 Ethiopian psychiatrists (bringing the country total to 41). These graduates have established five psychiatric departments outside of Addis Ababa and the retention rate for graduates has been an impressive 95%.⁴⁶ This shows the benefit of academic institutions in high-income countries focusing on global health in general and global psychiatry in particular and attempting to partner and build infrastructure through a relationship with a medical centre in the developing world.⁴⁵ Proper planning and training can improve long-term psychiatric care, which global health practitioners can assist in by advising and supporting national efforts.^{47 48} As the WHO has offered, there will be 'no health without mental health'.⁴⁹ This remains especially true for the developing world.

Our patient was affected by a multitude of global health problems. Her chronic disease and the reason for her current hospitalisation could likely have been prevented by control of this neglected tropical disease. Her present exacerbation could be the result of her abandonment of biomedical care for traditional medicine. Her decision to abandon biomedical care may be linked to or complicated by underlying psychiatric illness, for which she has no access to care. The tragedy is not that this patient and her family are suffering. It is that her illness and their suffering are largely preventable, but have been neglected by the global community as well as her own.

Patient's perspective

We understand that she has a chronic illness. Her liver is sick, and now the doctors are saying that her kidneys might be sick as well. We have no idea why she went to the holy water and left her medicine. We hope, and pray to God every day, that this will not be the end and that she will be made well and return home to us.

Learning points

- ▶ Our patient was chronically disabled as a complication of a likely preventable and treatable neglected tropical disease.
- ▶ Our patient was seriously harmed by her decision to pursue traditional medicine in lieu of biomedical services.
- ▶ She was put at-risk by the lack of mental health services available to her.
- ▶ With cooperation, long-term partnerships, financial support and innovation, all of the above problems can become history in the developing world.

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