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Podocniosis: A Disease of the Voiceless

Dembi Dollo, Ethiopia

Summer 2012

Podoconiosis or “Podo” is an endemic non-filarial form of foot elephantiasis that affects poor farmers in rural Ethiopia. It is caused by repetitive exposure to the soil, which contains a high concentration of volcanic and silica particles. The volcanic particles cut up the feet and the silica particles disrupt the flow of lymph. It is a slow process as Podo takes several years to develop (Davey, 2009). The farming communities in the highlands of Ethiopia are most vulnerable because the harmful soil exists in these regions and because they cannot afford shoes to protect their feet. Podo is a misunderstood disease and there are many false beliefs as to the cause. The factors that have led to the prevalence of Podo include immense poverty, the work intensive agricultural lifestyle, a poorly structured educational system and a ritualistic culture that does not socially accept scientific reasoning.

Land of Impoverished Riches

Ethiopia is a fascinating country because although it is rich in culture, landscape and natural resources, the majority of the people are very poor. The lack of money and wealth directly contributes to the numerous diseases and harmful health conditions. To understand Podo one must first understand the Ethiopian culture and the values, which the people hold dear. Most Ethiopians are spiritual farm laborers that believe respect and community are essential in a functioning society.

Courtesy and respect are some of the core values held. Respect is gained with age, so the elderly are held in high esteem. Affection is displayed in greetings and one may show respect for someone by supporting his right arm (near the elbow) with the left hand while shaking hands. A dependent blind elderly person is provided with a young girl

designated as a guide for that individual (Thomas, 2012). This however, robs the girl of her childhood, as she is responsible for directing the elderly person until he or she passes away. Heritage is important. Males are given a unique first name, but their middle and last name is that of their father's and grandfather's first names, respectively. To be considered a true member of society a man must be able to recite his heritage back 13 names.

Spirituality is an integral part of every day life. The cause of most diseases is believed to be a demon or evil spirit and so prayer, fasting, and meditation are common rituals that take place. According to the U.S. Department of State 43.5% of the population is Orthodox Christian, 33.9% Muslim, and 18.6% Protestant (Federal Democratic, 2009). The spiritual culture is a beautiful thing in that the people see minuscule objects such as food and clothing as blessings, however, science goes unrecognized and is an important component in understanding health and safety. The knowledge provided through science allows people to take a proactive approach against infection and disease.

Closely tied to the religious aspect of life is the ritualistic culture. Many young children have a lone patch of hair on the front of their head. Parents believe that if their children die young, God can reach down and pull them up into heaven by grabbing onto this patch of hair. Another ritual is that when someone dies, the entire family abstains from food until that person has been buried in the ground. The rituals even extend to coffee ceremonies, which are an important part of the culture. In these ceremonies the host families must follow a precise pattern of preparing the coffee beans and serving the coffee. The coffee beans are first roasted and then they are swayed in front of the guests so they can smell the fumes. Next, fresh grass is placed on the floor and the visitors are

served coffee in order of oldest guest to youngest. As a guest it is an insult to have only one cup of coffee, so it is important to drink several cups.

Community is also a key part of the Ethiopian lifestyle. Families create a communal atmosphere by trading farmed goods. The sense of community can also be observed by any foreigner through the hospitality that Ethiopians show. After meeting a stranger in the street it is not uncommon to be invited in for a coffee ceremony. The sense of communalism stretches to the realm of school where students are surveyed very closely during final exams and not allowed to bring cell phones to school because cheating is so prominent. The students do not see it as cheating because they believe that if they know the answer it is selfish to keep it to themselves. Therefore, there is not much academic honesty in the schooling system.

Women have a specific role and are expected to be the workhorse of the family. In the western world often the role of women is to take care of the children, clean the house, and feed the family. In Ethiopia, although they are responsible for all those tasks, they also are required to do the hard physical labor in the fields, retrieve water in heavy fifty-five pound jerry cans, and carry large loads of sticks, rocks and other heavy materials. In this culture the women are the first to wake, the last to go to bed, and they work the hardest during the time in between.

Women are treated much like property. Although it is common in many cultures for the bride's family to pay the dowry, in Ethiopia the man pays the woman's family¹ and buys gifts for both of the parents and all the siblings of the bride² (Schmanski, 2008).

¹ Usually at least 5,000 birr, which is rather a lot in Ethiopian currency

² The average number of children per woman in Ethiopia is 5.4 which means the groom usually has to buy at least four presents for the siblings

In this way he is almost purchasing the wife. The male must also pay the church a good deal of money for the marriage to be publically recognized by the community. These costs are almost certain to bring about debt to any suitor hoping to begin a family.

Agriculture is the primary means of income in Ethiopia as 80% of the work force is composed of agricultural laborers (Federal Democratic, 2009). Because livestock are essential in maintaining farmland, the streets are crowded with sheep, donkeys, and cows. This contributes to automobile accidents, which account for the second most deaths in Ethiopia³ (McNall, 2006). In the rural areas almost all families own farmland and at least a few animals. Ethiopia is rich in natural resources because the soil is full of nutrients, the land is expansive, and the rainy season stretches for a consistent four months (June-September). The main export is coffee, which makes up 65% of the exported goods. Other goods that are exchanged with foreign countries include livestock, gold, leather and khat, an Arabian shrub, which is chewed as a stimulant (Ethiopia Trade, 2012).

The pace of life is slow and it depends on the weather. During the rainy season (June-September) people stay close to home and tend to the crops. This season is accompanied by delicious fruit⁴ and a surplus of fresh water, because the rain can be collected for daily use. However, poor families struggle to put food on the table during the rainy season because they are still waiting for the harvest. Travel time is usually doubled because the roads are muddy and some are closed down. During the dry season (November – April) people will walk as far as 200 kilometers to see a doctor or go to a clinic (Thomas, 2012). Although water is limited during this time there is usually enough

³ The leading cause of death is AIDS

⁴ Most notably the mangos, avocados and bananas

food from the harvest to supply families. There is no moisture at all during this season. Dust lingers in the air and remains for ten minutes after a car passes by.

Life is simple, people eat with their hands, the day ends when the sun goes down, and laughter is integral to the everyday life. Tea and coffee breaks are a common occurrence in the working day and the lunch break usually extends an hour and a half (Erega, 2012).

Technology is primitive. To spread news it must be done by word of mouth because technology can scarcely be relied upon in rural Ethiopia. “The best way to educate people on Podo and other health issues is by going into town and knocking on door to door and telling them,” said Megersa Erega, a doctor at Danka clinic in Dembi Dollo (2012). It is difficult to pass information by other means than word of mouth and even when it is done successfully one must be discerning to know what information is viable and what cannot be trusted. The main reason why so many people in the community (and many of the Podo patients interviewed) have a false belief about the true cause of Podo is because their parents told them a myth about Podo that was passed down from generation to generation. This myth is accepted as a truth because there is no overarching figure that keeps all of society up to date on medicine and health concerns, as in the developed world there is the internet and social media. The few computers that exist in Ethiopia are bombarded with viruses because there are few people within the community that know how to remove them. A surprisingly large percentage of the people have cell phones. It is common to pay by the minute, which requires phone cards. Televisions exist in some houses but only those who have money can afford them. Although Ethiopians do not have much time to play sports because they are busy working

most of the day and physically exhausted when they retire to their homes, they enjoy watching televised soccer matches on the weekends with large groups of people.

The Ethiopian people are very diverse as there are many different skin tones and three main languages spoken throughout the country. Amharic⁵ is recognized as the national language however more Ethiopians speak Oromo⁶. Another primary language that is spoken is Tigrenya⁷ (Ethiopic Languages, 2000). The cultural collage formed by all these unique facets produces humble and simplistic communities that are satisfied with the way of life. This satisfaction and acceptance of how things are is perhaps why the country is so underdeveloped.

Podo At Large

Podoconiosis or “Podo” is a rare form of elephantiasis, which develops in the feet and lower legs. It primarily exists in high altitude, poverty stricken regions of Ethiopia. Unlike most forms of elephantiasis, it is non-filarial, meaning that rather than being caused by a parasite⁸ it is caused by repetitive exposure to soil that contains silica particles. Podo is also referred to as Mossy Foot because the outer layers of the foot take on a mossy appearance. One million Ethiopians are affected nationwide and 11 million people, roughly 18% of the population, are at risk because of exposure to the alkali soil (Destas et al., 2003). It takes several years to develop and most commonly appears in the first or second decade of life (Davey & Tekola, 2007). It affects both males and females and while most studies show that females have a higher tendency of getting Podo (Price

⁵ Amharic is spoken by 32% of Ethiopians

⁶ 40% of Ethiopians speak Oromo, which is also referred to as Oromifa and Afon Oromo

⁷ 32% of the population speaks Tigrenya, these people mostly live in Northern Ethiopia

⁸ Like a mosquito or worm

1976), this could be because males more commonly wear shoes (Davey, 2008). It is an asymmetrical disease but most patients have bilateral cases.

Ethiopia is a mountainous and elevated country and because of this, the soil composition contains a large percentage of volcanic rock and silica particles. Podo only occurs at altitudes higher than 1500 meters because this is where this soil is prevalent (Davey & Gebre Hanna, 2007). These particles form microscopic cuts in the feet, are absorbed after repeated exposure, and cause an inflammatory response. This creates lymphatic fibrosis, which disrupts the lymph flow (Frommel & Ayranci, 1993). Poor farmers are vulnerable because they cannot afford shoes and they are required to work long hours in the fields to provide for their families. Podo is a completely preventable disease, which could be eradicated with efficient distribution of shoes to these poor areas. However eradicating the disease becomes complicated with the lack of technology, the poor level of education and the primary means of income being derived from the agricultural lifestyle.

EW Price was one of the first scientists to make noticeable progress in discovering Podo during the 1970's. He conducted studies on the epidemiology, aetiology, pathology and natural history of the disease. He even came up with the name "Podoconiosis" which is derived from the word "podo" meaning foot and "konos" meaning dust in Greek (Davey & Tekola, 2007). Price found that there is a genetic component to Podo, as it is an autosomal recessive trait (Price, 1972). However carrying this trait only makes it possible for the individual to develop the disease, but with proper footwear these individuals will not be at risk.

Many believe that there is no effective treatment for Podo. “[Podo] patients will go to the hospital and the doctor will tell them that it is hereditary and there’s nothing that he can do to help,” said Erega (2012). This is a common misunderstanding which creates a large problem. Many patients feel as though they are helpless and need to accept this disease as their fate, when in actuality they can combat the disease and with continual care and dedication, completely remove it. The solution lies within education and shoes. Podo used to extend to European countries such as Scotland, Ireland, and France but because shoes became prominent as those countries developed, Podo completely disappeared in those areas (Davey, 2009).

The Local Fight

In Dembi Dollo, Danka clinic is dealing with several challenges. Since 2003, the main source of financial support has been a Spanish non-profit organization called Manos Unidas. However, due to the current poor condition of the Spanish economy and the Euro, Manos Unidas has notified Danka that after this December they will be withdrawing funds. The clinic is responsible for the 32,000 people in the surrounding six villages. However, it receives almost nothing from those patients, whose co-payment fee is 3 birr⁹ and they usually only give what they can as a payment for medicine (Erega, 2012). The hospital in Dembi Dollo does not provide aid to Podo patients, making Danka their only refuge. Furthermore, instead of the government providing financial support, they require the clinic to pay them an annual fee of around 20,000 birr. Tropical Health Alliance Foundation (THAF) financially supports Danka and most of this money goes

⁹ Equivalent to about \$0.17 USD

directly to patients with Podo. THAF also supplies money to help preserve local freshwater springs and fight against polio, fistula, cataracts, and uterus prolapses.

It costs the clinic about 50 or 60 birr a year for one Podo patient. Many of the patients are too poor to pay this fee but they are required to give some sort of contribution, however small it is. The price per Podo patient does not seem to be much but it adds up to around 75,000¹⁰ birr per year, which is hard to come by without support from the government. At the moment, the financial needs of the clinic are not being met. “Right now we can only efficiently serve around 700 or 800 Podo patients out of the 3,000” said Erega (2012). He has a few different project ideas to use the money allocated to these patients in the most efficient manner. One is to work with a third of the patients for two or three years until there is a definite improvement and the patients are self-sufficient, and then to move onto the next group. The second idea includes raising 20,000 to 30,000 birr¹¹ and training people who specialize in Podo treatment to work in the clinic. This way there would be more people to tend to the needs of the patients.

Although the cost per patient is very cheap, for many farmers this cost is rather expensive. “There are many, many, many elephantiasis patients in the area that do not come to the clinic. The reason is lack of money.” Said Adimasu Gamitesa, an employee of Danka (2012). Thus, the majority of the Podo patients do not seek help. An Ethiopian proverb reads “One who hides his illness has no medicine, one who hides his problem has no remedy” (Phillips & Carillet, 2006). Unfortunately, many people prolong Podo without making any effort to treat it. Once it gets to the stage where they can no longer

¹⁰ Equivalent to \$4,161 USD

¹¹ Equivalent to about \$1,100 to \$1,600 USD

bare the discomfort, they make their way to clinic. Often this is too late because the damage has become permanent.

Social Stigma

In Dembi Dollo there is not much social stigma that surrounds Podo. Some would argue that this is because the community is religiously oriented¹² and stands true to morals surrounding fair treatment and loving others. Many locals believe that they must treat all people with a certain amount of respect. One Podo patient said, “Because I live at a Protestant church, they all know of God and read the bible. They believe everyone must be treated equally”. Only four or five out of a hundred Podo patients do not get married because of the Podo. In those cases the reason, more specifically, is because the Podo is so large that they cannot move around on their own, work in the fields or help provide for a family. In the Ethiopian agricultural communities walking is the only means of transportation and farming is the only means of income and providing for one’s family. This therefore makes sense that in the extreme cases individuals usually do not get married. Though there is not much social stigma towards Podo in the main villages, further out in the remote countryside where there are no practiced religions, there is more of a problem with discrimination (Erega, 2012).

False Beliefs

Most people believe that Podo is either caused by alcohol residual falling on the feet, rays of the sun shining directly on the feet, or a demon of some sort attacking the

¹² 75% Orthodox Christian, 15% Protestant, 5% Muslim (Puesta, 2012)

individual. Other popular beliefs include coffee residual falling on the feet, eating banana sap, prostitution, that it is 100 percent hereditary with nothing to do with the soil, that it is caused by snakes venom, and that it is a disease of the poor, inflicting itself upon poor people simply because they belong to that class. Very few people know the true cause of Podo. This was illustrated in the thirteen interviews conducted at Danka clinic, where not one interviewee understood the actual cause. Some even believed so strongly of a false cause that when told that the soil was the source of Podo they became frustrated and insisted that their belief was in fact true. It is difficult to convince people of the scientific cause of Podo because they hold tightly to their theories and beliefs. The biggest step in the fight against Podo is getting everyone to understand the cause of it. Once they are educated about this and believe it as a truth, it will be much easier to prevent and treat this disease.

Currently the fight against Podo is an uphill battle. Though more people in Dembi Dollo are wearing shoes than in previous years, the shoes must be taken care of and cleaned or else individuals are still at risk. Also the shoes must be worn consistently. Some people will wear shoes, get tired of them, take them off for a while, then put them back on later. It must be understood by the entire community that particles in the soil are what cause Podo and the other myths are untrue. If they understand this, they will understand firstly, the importance of wearing shoes and the direct relationship that being barefoot has with developing Podo, and secondly, they will understand the importance of keeping their shoes clean because dirty shoes can contain the particles and be a threat to the individual. As long as people are not aware of the cause of Podo, they will blindly expose themselves directly to it.

In the fight against Podo there are three essential elements that each play a role in getting rid of the disease. These include education, prevention, and treatment. Education is arguably the most important as it is inextricably linked with the other two.

Education

Education is the cornerstone of any society, the building blocks, which support all the other structures. In the poor areas of Ethiopia the education is lacking. It is evident in the early years that the quality of the elementary school teachers is poor. Unlike in most of the developed world, one does not get to choose which university he or she attends. Instead everyone remaining in school at the end of grade 12 takes a test that, depending on the score, allows entrance into specific universities. Most students are only allowed to take the test once, and after that their future careers are set in stone. Therefore, many teachers do not wish to be teachers but rather they are only accepted into universities for teaching. The best teachers are designated to the upper grades, leaving the least qualified and least motivated teachers to educate the beginning grades. The early years are invaluable in determining future success and desire to learn, as well as laying a strong foundation. This system contributes to the large amount of students that drop out of school and accept a life of working in the fields instead of an education. “About 45-50% of the kids who enter into primary school end up graduating from 12th grade. However, there are also a lot of kids who never even enter school in the first place” said an anonymous Peace Corps volunteer (2012). The reason for this is that communities do not place much value upon education.

The schools do not inform people about the health concerns in the community. The lack of education often causes the severity of the ailments. At the eye clinic in Assosa, the majority of people screened could not be treated because they had simply waited too long to get help. It was an unfortunate reality that those people would be blind for the rest of their lives. The same is true with Podo, if treated early enough it does not interfere much with the individual's life. However, if it is neglected for some time, it becomes severe as secondary infection takes over and often the feet do not return to normal.

Prevention

The first step in prevention is education, as described earlier. Once this is achieved there are two other steps. The first is providing partial food support to families that cannot provide for themselves. Partial food support is necessary for the families that are struggling to put food on the table. If they are not provided with this support, the other resources given to them with the intention to help fight and prevent Podo¹³, will rather be sold in order to attain food for the family (Erega, 2012). It is important that partial food support is given, not complete food support. The reason for this is to ensure that the family does not completely depend on the clinic, because the clinic will not always have the funds to support the family. This encourages the family to provide for themselves and eventually become independent. The model in which some effort is made by both parties is much more sustainable than that in which the clinic gives freely asking nothing of the recipient.

¹³ Shoes or soap

Next, durable shoes must be provided at a relatively low cost. Once again shoes are not simply given away but they are sold. This forces the patients to make an effort rather than feel helpless due to their circumstances. Also when the patients pay for their shoes they tend to take better care of them, which in turn makes the shoes last longer. “If you make them pay at least 10 or 20 birr they take care of their shoes and the shoes end up lasting four or five months, however, if you give them the shoes for free they will last only 18 days!” Said Erega (2012). Prevention is a very crucial element in the fight against Podo, because in it lies the solution to completely eradicating the disease.

Treatment

Where prevention is the proactive approach, treatment is the defensive stand that must be taken. Treatment is made up of cleaning, bandaging¹⁴, and protecting the feet. The cleaning process has several steps. The patients are instructed to first rinse the feet in water and lather with soap¹⁵, and then pour that water out. Next they fill the tub back up with water and put bleach powder in it. They soak their feet in this for ten minutes. This sterilizes the feet, which is a necessary step before applying the herbal oil. The last step is removing the legs from the water, letting them dry, and then applying the herbal oil. This provides nutrients for the skin, which strengthen and heal the feet (Gamitesa, 2012). The patients are advised to perform this procedure at home three times a day. Many say that they do not experience much pain unless they bypass this cleaning process for a long period of time.

¹⁴ Only necessary for some patients with very large Podo

¹⁵ Scrubbing between the toes is very important

Those instructed on bandaging their legs and feet must do so for the entire day. This is the best way to reduce the swelling as the edema is forced up into the body through the lymphatic system. Elevating the feet also helps as gravity can assist in decreasing the edema. Sometimes antibiotics are needed in treatment of secondary infection. “About 20-30% of the Podo patients develop secondary infections and often it is among the elderly because they are not as self-dependent,” said Erega (2012). Older people cannot walk to the spring to get water for washing their feet, thus the bacteria multiplies. They then end up sleeping most of the day, which makes it worse.

The Podo patients must also be educated on the cause of Podo during treatment, so that they can take care of themselves and inform others on how to avoid getting the disease. Thus, treatment can be transformed into prevention through Podo patients educating others.

Tomorrow's Shoes

One company that is assisting Danka clinic in the prevention of Podo is TOMS shoes. TOMS is a for-profit organization that was started by Blake Mycoskie, an entrepreneur from Texas. While vacationing in Argentina, Mycoskie was enamored by the comfortable alpargata, a traditional Argentine shoe similar to a moccasin. He also noticed that many of the local children did not have shoes. He joined these two together with a business idea, which was to create a stylish shoe that when purchased, a pair is given away to a child in need. This is how the ‘One for One’ slogan came about. If a customer buys one pair of shoes today then a pair is given to a child in need tomorrow. He modified the alpargata by adding a leather insole and an improved rubber sole

creating a blend between Argentine fashion and California surf culture. The name came about as Mycoskie toyed with the phrase “Shoes for a better tomorrow”, which was eventually modified to “Tomorrow’s shoes” which then became TOMS for short. TOMS has revolutionized the shoe industry. It instantly became a topic and hip brand with passionate supporters who are anything but quiet about its cause. In Mycoskie’s book *Start Something That Matters* he wrote, “A story evokes emotion, and emotion forges a connection” (2011). TOMS has a story and those who buy the shoes feel an instant connection to this story and cause. While other companies try to bombard potential clients with facts about how good their product is, TOMS tells of how every shoe purchase makes an impact in a child’s life. This is what separates TOMS from other common shoe brands. It is innovative because while people are satisfying their own consumer needs they are also conveniently helping provide a child with shoes (Mycoskie, 2011).

Several years ago Mycoskie visited Dembi Dollo to meet with Megersa Erega and arrange a plan for shoe distribution through Danka clinic (Stafford, 2011). One misconception however, was the quality of the shoes given away to the children in need. “In America they have the consumer believe that the child is getting a quality pair of shoes, when in reality that is not so” said Sister Evelyn Puesta (2012). Unfortunately, the quality of the shoes for the children was not very good at all. Where TOMS cost upwards of \$80 in the US, the shoes given out to the children of Dembi Dollo were stiff plastic shoes worth no more than two dollars a pair. In some cases the shoes even worked to a disadvantage. These plastic shoes did not absorb sweat, so the feet had to absorb it. This

would soften the feet and diminish the calluses. Then when the shoes were no longer usable, the child had more vulnerable feet.

TOMS brought two deliveries of the cheap plastic shoes but more recently they delivered a load of cotton shoes to Danka clinic. The cotton shoes are a big upgrade from the previous plastic model. These are more durable and look similar to Converse shoes. Every load includes 7,000 pairs of shoes. Although this is a large number, the demand for shoes stretches beyond it. Dembi Dollo lies in the region of Kellem Wollega, which Erega estimated needs 200,000 pairs of shoes per year (Erega, 2012).

An area in which TOMS and Danka differ in philosophies is in their methods of shoe distribution. The administrators at Danka clinic believe that it is important to ask for a contribution, however small it is, so that the person receiving the shoes, medication, treatment, or support does not completely depend on the clinic. Not only that, but the patients take better care of the items they receive if they pay at least a portion of the cost. TOMS wants all the shoes to be given away freely. They believe that since the people live in such poverty they should not be required to pay at all for the shoes. A good solution would be for the families of the children to be encouraged to give a contribution, even if it's five birr¹⁶. Then later this contribution could be used to buy shoes that would be given to the same group of people once their shoes are worn out. By giving away the shoes completely free, it makes it easy for people to feel as though they have nothing to give and are helpless, when even the poorest people usually have some money.

Eventually, these people will have to provide for themselves. If they fully depend on TOMS, when TOMS can no longer provide for them they are back to where they

¹⁶ Equivalent to about \$0.28 USD

started. The solution must come from within, because this part-time solution from the outside is not sustainable. Surgeons Over Seas (SOS) demonstrates a good model of this by acknowledging that they cannot save the world by sending highly trained US surgeons to all these developing countries. Therefore to help the underprivileged, they have created a more sustainable plan by training the surgeons in these poor countries (www.humanitariansurgery.org).

TOMS is doing a great deal of good in the world by providing shoes to children. Although the relationship between Danko clinic and TOMS has been rocky in the past, it looks like it will improve as TOMS continues to show more concern with the quality of shoes donated. Their effort has been very gracious and they have helped a good deal in the fight against Podo. Blake Mycoskie's revolutionary idea about shoes transformed consumerist desires to be satisfied in a way that provides for the poor. This idea should not only be limited to shoes but it should be expanded to providing food and water to poor communities as well.

Other Health Issues

Although Podo is a very unusual and disturbing disease, there are other medical conditions in Ethiopia that are just as pressing and possibly more tragic. The most notable is vesiculovaginal fistula or just "fistula", which happens to females in remote villages. Fistula is caused when very young teenage girls whose skeletal structure has not yet fully developed become pregnant and go into labor. The pelvis is too narrow to push the baby through but because a Cesarean section is not an option, since these females have neither money nor access to a health center, the baby's head is rammed against the pelvic bones

repeatedly. The baby dies 90% of the time and when the labor is finally over not only is the woman left with a physical impairment but also an emotional scar (Amina et al., 2011). The physical damage occurs to the bladder and the cervix leaving a hole by which fluid constantly runs through. Instead of the normal flow of urine, going from the urinary bladder through the urethra then voluntarily through the vagina, the urine constantly leaks from the bladder and runs down the woman's legs. Infection is certain to ensue, which brings with it a horrible smell (Verghese, 2009).

No one wishes to be around these patients because the smell is sickening. They are shunned by their families, betrayed by their husbands, and disowned by their friends. The isolation and ostracism causes many of them to contemplate suicide. Danka clinic has a program funded by THAF in which these women are financially supported to receive fistula surgery. THAF pays for the women's travel to and from Addis Ababa, one of the only locations where the surgeries can take place, provides food and lodging, and covers the cost of the surgery. So far Danka has helped more than 119 women recover from fistula and regain their normal lives.

Blindness in Ethiopia is also a very large health concern. Ethiopia is one of the highest per capita countries for blindness at 1.5%. This percentage is three times more than the World Health Organization's (WHO) criterion for classifying blindness as a severe public health problem (Lewallen & Courtright, 1991). It is unfortunate that there is excessive blindness but it is even more saddening that 80% of the blindness in Ethiopia is either preventable or treatable. The extreme poverty and lack of health care prevents people from the healing medications or getting corrective surgery (Samuel, 2012). There is an ophthalmologist to population ratio of 1:2.2 million people, which makes it very

difficult to receive surgery. Most blindness in Ethiopia is due to trachoma¹⁷ and the second leading cause is cataracts¹⁸ (Lewallen & Courtright, 1991). Trachoma is also called granular conjunctivitis and it results in the inflammation of the mucous membranes of the eyes. It is contagious and often spread through hand to eye contact. If trachoma is treated early enough with antibiotics, it can disappear within four to six weeks (Riordan-Eva, 1998).

Cataracts are caused by the hardening and eventual loss of elasticity in the lens. Vision becomes cloudy and finally blindness ensues. The surgical procedure to repair vision in a cataract patient only takes about ten minutes and the average cost per eye is \$50 (Thomas, 2012). THAF funds an eye team several times a year to do cataract surgeries for locals who are too poor to see an ophthalmologist. These patients are very grateful when they receive the gift of vision. Blindness is also caused by malnutrition and vitamin A deficiency at an early age, the herpes virus, UV light damage, and glaucomas. Glaucomas have the most severe consequences. The pressure in the eye builds up so that there is intense pain. Once it has gotten to a certain stage the optic nerve is completely damaged and vision cannot be restored. This is when patients need the eye removed to alleviate the discomfort and pain.

Another common health issue among women is a uterus prolapse. This is caused by weak muscles and ligaments, which hold the uterus in place inside the body. Although not as severe, the stigma surrounding this is similar to the fistula problem because usually the husbands will leave their spouses. The uterus comes out of the vagina and hangs below almost similar to how a man's scrotum hangs. Once the uterus is prolapsed the

¹⁷ 290,000 out of the estimated 720,000 blind

¹⁸ 205,000 out of the estimated 720,000 blind

woman can no longer have sex, which is one of the main reasons why the husbands leave their wives. Fortunately, this surgery is not as difficult or expensive as the fistula surgery and can be done at the local hospital. After a few weeks the women can go back to living a normal life.

The developing world is an uncomfortable place to live. The discomfort that an outsider might feel while visiting does not compare with the pain and hardships that the average citizen must endure day in and day out. However, Ethiopians do not have a negative outlook on their conditions, instead of being disheartened by difficult circumstances, they view good health as a blessing.

Future Steps

It is easy to become overwhelmed by the problems of the undeveloped world and feel powerless to make a change. One must focus on a specific field and make small changes in that field. It is also important to understand that money is not the solution to all these problems. Follow-up must be included to make sure the money invested is directed towards the intended purpose. The solution to many of the problems in Ethiopia has to do with education and sustainability. If the population were to be educated about the causes of the diseases, they would make more of an effort to avoid these harmful conditions. If Ethiopia had more self-sustainable programs in rural areas, then the people could provide for themselves and not rely on foreign donations. The lack of sustainability is the root of many problems including lack of clean water, durable shoes, and food.

Doctor Gale Davey is today's leading researcher of Podo. She is a professor at the medical University of Addis Ababa and receives money to do her research from the

Wellcome Trust, a global charitable foundation that funds research on the medical humanities (www.wellcome.ac.uk). Her research focuses mainly on the cause of the disease and which part of the population is most vulnerable to Podo. Davey helps with the Mossy Foot Treatment and Prevention Association (MFTPA), a charitable organization that raises money to help support Podo patients in their transition back to the workforce. The MFTPA provides hope for these individuals by creating a sustainable, community-based model to combat the disease. First, patients are instructed in proper techniques¹⁹ to eliminate Podo so that they can take care of themselves. Once they are confident in this and feel independent, they are appointed as Community Podoconiosis Agents (CPAs) and are sent out into the community to educate other people about the cause and solution of Podo. The CPAs then select Podo patients from the community who can no longer work a labor-intensive job, and train these individuals in jobs such as shoemaking or hairstyling so that they can provide for their family (Davey, 2008). The ideal situation is to create a sustainable system in which Podo patients make shoes to supply other individuals who are at risk of the disease. This helps to eradicate the disease, but also provides jobs and income to people in need. MFTPA has achieved this in the Wolaitta zone, however Dembi Dollo does not have such a system.

The Daughters of Charity have several sustainable programs by which they provide for Podo patients. This is a Catholic organization that serves the community by supporting local clinics and providing for people in need. One way that they do this is by giving two female sheep to recovering patients. This allows the patients to become independent without working on the land. The sheep give birth to two or three lambs

¹⁹ Primarily washing feet and wearing shoes

twice a year. Then after three years the patients are asked to return one female sheep to the Daughters of Charity, which is given to a different patient in need. Because of this program, several families are able to send their children to school, eat three meals a day, and repair roofing with iron sheets instead of grass. These are all luxuries they did not have prior to this program. Another program created by the Daughters of Charity is the silkworm project in Samerro²⁰. They bought silkworms and hired four people to take care of them by feeding and cleaning the trays. They can later sell the silk in the market and collect revenue. This program will expand as time goes on providing jobs for more people.

Some small steps that would improve the current Podo conditions in Dembi Dollo are putting up Podo posters that explain the true cause of the disease and illustrate prevention methods, and creating a shoe-making factory in the village, much like the one that the MFTPA has created. This would both create jobs and also provide shoes for those at risk. This is not attainable at the moment because Dembi Dollo is far away from the capital city of Addis Ababa, which makes it difficult to get supplies. Also, the specialization required in making shoes and the cost of the materials and machinery are too expensive. However, if there was a cheap and simple way to make durable shoes and if the road conditions to Dembi Dollo improved, this could happen.

Before anything else though, the people must understand the true cause of Podo. “They [Ethiopians] are fascinated by television. If you could somehow get them to watch a movie on Podo then maybe that could get through to them” said Larry Thomas, the

²⁰ A town 30 minutes walking distance from Dembi Dollo

chair of THAF (2012). Perhaps a solution is to make an educational film to be shown publicly to the community and those who watch receive free shoes.

It will take persistence to convince the Ethiopian people that Podo is caused by the soil. Once this is achieved they will place more value upon wearing shoes. Because there are so many other diseases and health conditions in the undeveloped world it makes it more difficult for Podo to be recognized and funded. Organizations such as THAF, MFTPA, TOMS and the Daughters of Charity however, are making progress in the fight against Podo. It is difficult to break through the traditions and rituals of a culture that prides itself on those exact things, but with well thought out strategies, this disease could be eradicated in the next several decades.

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