Strengthening diabetes treatment for children in Africa

In under-resourced countries, type 1 diabetes is often misdiagnosed and can be a death sentence for young patients. Graham Ogle, MD, of *Life for a Child* is educating patients and health professionals in African countries to recognise and treat the disease. Awareness and regular glycated haemoglobin testing are two of the keys to success.

Text: Janine Stephen

Imagine an ill child in an under-resourced African country. The country, like many around the world, has dedicated doctors and nurses, but limited healthcare facilities. The youngster has lost weight, resumed bed-wetting, always seems to be hungry and thirsty, and is suddenly woozy and fatigued. Scarce family funds are used to transport the child to the nearest hospital, four hours away. Yet even here, the signs of diabetes may be missed. Lack of knowledge about type 1 diabetes is not only a norm for new patients, but for some health workers too.

"In many countries there were very few children living with type 1 diabetes up until a few years ago – because they were dying," explains Graham Ogle, MD, of the International Diabetes Federation's *Life for a Child* (LFAC) program. Unlike many communicable diseases, type 1, the most prevalent form of diabetes in children, is uncommon. "The presenting features of type 1 diabetes can look like pneumonia or gastroenteritis or typhoid, and children are often misdiagnosed." Also, some health facilities don't have critical resources to treat the auto-immune condition.

The organization *Life for a Child* fights childhood diabetes in 19 African countries.

Access to life-saving diabetes resources

Life for a Child's mission is to change this. Ogle, the organisation's general manager, is a widely-published paediatric endocrinologist who has worked in countries from Cambodia to Papua New Guinea. LFAC works in 19 African countries, as well as under-resourced countries from South America to Asia, to make sure that young people under 26 with diabetes access the medication they need to stay alive. "We work with existing local diabetes centres to provide supplies such as insulin, syringes, and blood glucose monitoring equipment," says Ogle. Just as important is providing training, education materials, and support to both families and health professionals. LFAC helps over 10,000 children on the African continent.

Diabetes can be a silent killer. In 2012, eight in ten diabetes deaths occurred in low- and middle-income countries.[1] The International Diabetes

Federation (IDF) estimates that in sub-Saharan Africa, almost seven in ten diabetes cases go undiagnosed, and about 50,600 children and adolescents under 20 live with type 1.[2]

Genetic and environmental reasons drive type 1 incidence variations. Some countries, particularly Eritrea and Somalia have higher incidences than others, according to Ogle. Overall, numbers are rising [3] , adding a heavy financial burden to health systems and families.

"Many clinics and health facilities may not stock insulin," says Ogle. "Even if there is a public health supply, it's a complex logistical exercise to get the supplies to reach the children. That's where LFAC's local partners come in." Contact with far-flung patients is easier thanks to mobile phone ownership. But literacy and numeracy levels can be low – important when training people to inject insulin and monitor blood glucose levels. Even storing insulin at low temperatures is hard in areas with no electricity. "Clay pots with evaporative cooling can be effective in very hot countries like Sudan," Ogle says. [4]

Vital HbA1c tests

In such contexts, Point of Care (POC) testing is invaluable. Once diagnosis and acute symptoms are dealt with and the child "can be well again," says Ogle, then long-term care kicks in: checking compliance, monitoring average blood glucose levels, and adjusting treatment. This prevents chronic complications that can be "devastating", like retinopathy, renal disease, or neuropathy.

"The HbA1c test is vital," Ogle says, and instant results ideal. Blood can be taken at a hospital or clinic and sent to a lab – but by the time the results are available, the family has often left. "With POC testing, the result is available in six minutes. You can have a discussion on the spot and educate the family," Ogle says. With the Siemens DCA Vantage® Analyzers that LFAC uses in Africa, albumin levels in urine can also be tested: "an early warner for kidney disease".

While cartridges for the POCT machines can be expensive and difficult to supply, the HbA1c test has many advantages. The reading provides a benchmark against which to measure progress. "This one number gives you the overall medical picture of how the young person is doing," Ogle says. "If we keep that number at a reasonable level, we can delay or prevent complications. You can educate the patient about how they're doing compared to the last time they visited. It's a feedback loop for health professionals and patients." A clinic's mean HbA1c value for its type 1 patients is also a valuable marker of the level of care it offers – and can measure improvements.

Guidelines for less-resourced medical staff

Local context and insights are incorporated into LFAC's education materials: One way to recognise diabetes is when ants are attracted to urine, as this means it is full of glucose. The materials produced include compact guidelines for less-resourced countries. "Doctors and nurses who have not seen type 1 before basically need a recipe book – a practical, step-by step guide[5] tailored to the resources at their disposal," says Ogle. LFAC also gives workshops to health workers in partnership with The International Society for Paediatric and Adolescent Diabetes. At a 2018 event held in Ethiopia, over 50 doctors and nurses discussed issues such as access to care and complicated cases, while families gave the patients' perspective.

Children relate to pictures and stories. One resource is "Moseka", an accessible comic written by Marguerite de Clerck, MD, for children in Democratic Republic of the Congo[6]. LFAC has translated it into English and Swahili, and the Rwandan government printed it in Kinyarwanda. Educational camps for children are also very successful. And in Tanzania, the Diabetes Youth Alliance has a WhatsApp group that facilitates peer-to-peer learning.

Diabetes patients take control

A study in Rwanda proved that education, with systematic care and regular HbA1c testing, can dramatically improve mean HbA1c levels[7]. LFAC helps with capacity building, supplies and education, but says Ogle, "the wisdom of the doctors, nurses and extended families" makes the lasting difference. Patients learn to take control. "We've even heard of children teaching nurses how to give injections." Thanks to testing and increased knowledge, type 1 diabetes need no longer be a death sentence. ●

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Graham Ogle, MD, *Life for a Child*

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The statements by Siemens Healthineers customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption) there can be no guarantee that other customers will achieve the same results.

[1] http://www.who.int/features/2014/kenya-rising-diabetes/en/
[2] http://www.diabetesatlas.org/ (Eighth edition, 2017)
[3] http://www.diabetesatlas.org/ (Eighth edition, 2017)
[4] https://www.ncbi.nlm.nih.gov/pubmed/27472257
[5] https://lifeforachild.org/about/education-resources.html
[6] https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwicjPOd0bnbAhUIJ8AKHSXpCulQFggoMAA&url=https%3A%2F%2Fwww.lifeforachild.org%2Fcomponent%2Fattachments%2Fattachments.html%3Ftask%3Ddownload%26id%3D1341&usg=AOvVaw2kEDl_22cbX7HV7coxrd7X
[7] https://www.ncbi.nlm.nih.gov/pubmed/25458328

Diabetes in sub-Saharan Africa

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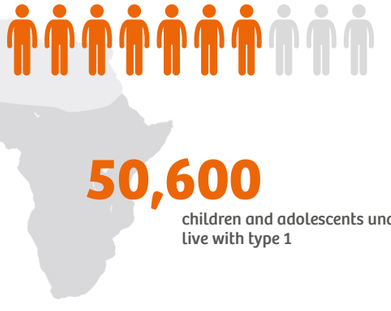

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