

## Carbon monoxide-based sickle cell treatment to be tested in Jamaica

Despite its toxicity, the colourless, odourless carbon monoxide will form the basis for a new treatment to be tested among sicklers in Jamaica, and if found to be successful, could lead to a better life for sickle cell patients worldwide.

The treatment is being developed by Sangart Inc, a global biopharmaceutical company that produces life-saving medicines that targets oxygen-deprived tissues. After more than a decade of research, the company has combined the human haemoglobin with carbon monoxide to create MP4CO, and will be conducting trials in Jamaica, France and the United Kingdom to determine the efficacy of this treatment for humans.

Sickle cell disease is a genetic disorder which results in carriers developing abnormal haemoglobin molecules, thereby impacting on the transportation of oxygen to the various tissues. As a result of this, sicklers usually experience painful crisis and develop other conditions such as anaemia.

Head of the Sickle Cell Unit in Jamaica, Professor Marvin Reid, told the Observer that the unit agreed to the study due to the fact that treatment options for sickle cell patients are very limited. It is his hope that the drug will be found useful in the treatment of painful conditions or painful crisis that occurs with sickle cell disease.

"Currently, the treatment options are limited and could be described as basically supportive therapy. So what we do is that we treat you whenever it is that you have a complication, or there is an option of doing bone marrow transplant which is only done in first world countries. That in itself is considered to be experimental therapy because they don't have enough evidence currently as to its long term effect," he said.

"This company, Sangart, has developed a molecule which is the derivative of haemoglobin and what they have done is that they have attached to this haemoglobin molecule carbon monoxide, so that when you use or infuse this particular molecule into a human, what happens is that it releases some of this carbon monoxide and we think this is one mechanism or one method that it will use to induce some benefits in sickle cell," he explained.

While the UK has already recruited at least one patient for testing, Jamaica and France are yet to start testing their first patient. However, Professor Reid said his unit is just only now in the process of recruiting healthy volunteers for treatment. The study has been approved by the University of the West Indies, Mona Campus, where the unit is located, as well as by the Ministry of Health.

"What we are trying to do is to just determine what is the appropriate dose and whether or not there are any major issues with regards to the drug, because you cannot predict everything, you have to test it to see whether or not there are any effects at all that you didn't anticipate based on your understanding of the chemistry or the molecule," Reid said.

Carbon monoxide is generally referred to as the silent killer because although it is very hard to detect, it can prove fatal when inhaled. A study which was published in the American Society of Hematology in 1975 entitled, "The effect of carbon monoxide on red cell life span in sickle cell disease", saw the administering of carbon monoxide at a concentration of 1,000-2,000 ppm (parts per million) to sickle cell disease patients.

"The administration of carbon monoxide is not recommended as a treatment for sickle cell disease. However, further trials would seem to be justified if conducted under careful controlled conditions," the study concluded.

Professor Reid admits that inhaling carbon monoxide can be toxic to humans and it is for this reason he said that Sangart Inc will be administering it intravenously to patients instead.

"The expectation — and this has been borne out by our lab studies — is that you will not get the level of carbon monoxide that you will get with the inhalation route," he said.

"So at low concentration, it is very good, at high concentration which is what everybody knows about, carbon monoxide is dangerous because it causes you to basically suffocate really," he pointed out.

Still, he said, they are not sure what the effects of this treatment will be, even when taken intravenously since this is only the first phase of this study.

"At the end of the day, if it turns out that the side effects are such that it makes no sense, then obviously then we can't proceed," he said.

While he could not say how many Jamaicans were born with sickle cell disease or carried the trait, Professor Reid said the figure exceeds those living with congenital heart disease.

Sustained efforts to get sickle cell drugs listed among those that are subsidised by the National Health Fund have proven futile since the agency has not updated its list for some time now.

Prior to the change in government, Professor Reid said a memorandum of understanding (MOU) was being worked on between his unit and the Ministry of Health, which if signed could see sicklers getting better access to drugs. It is his hope that the new health minister will facilitate this MOU coming into effect.