



Sickle cell disease: a lethal advantage

Sickle cell and the gene

SUSAN RAE

Simple blood tests, which could identify the presence of sickle haemoglobin, or haemoglobin S as it became known, had shown by the 1920's, that not everybody who had haemoglobin S in their blood, had the disease. It soon became apparent that sickle cell disease was inherited, and that the pattern of inheritance suggested a relatively simple genetic explanation.

ACTUALITY

Number 1 is normal, AA, as you can see it's negative because you can see the lines through the solution. Number 2, sickle trait, which is very turbid and you can't see through. The third one also, SS, again there's lots of turbidity, you can't see the line. The difference between the two is this one is a little lighter because of the anaemia, the sickle cell anaemia, but you still see it's very cloudy and you can't see the line.

KWAKU OHENE FREMPONG

Sickle cell disease is an inherited disease, that means you're born with it, you cannot catch it or contract it from another person, it's not a contagious disease. Our hair colour, our eye colour, all of these things are inherited from our parents. What our parents give us for these characteristics are genes. The type of blood that we make is also dependent on the genes that we inherited from our parents, and inside our red blood cells the type of haemoglobin we make is also dependent on the genes we inherited from both our father and our mother. Now there are healthy people who can carry the sickle cell gene, these are people we refer to as having sickle cell trait. They have inherited the normal set of genes from one parent, and then the sickle cell gene from the other parent. Such people are also referred to as AS because they make both haemoglobins A and S.

SUSAN RAE

If both parents of a child have sickle cell trait, AS, then they can have children with three possibilities: A child with normal haemoglobin AA. A child like themselves with both haemoglobins A & S, sickle cell trait, or a child with only sickle haemoglobin, SS, and hence Sickle Cell disease. Developed statistically, this means that at each pregnancy, there is a 25% chance of having a child with normal haemoglobin, a fifty percent chance of having a healthy child, but with sickle cell trait and a 25% chance of having a child with sickle cell disease, SS.