Blood diseases sickle cell anaemia biology essay

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Student’s Name : Lee Pei YiStudent ID : A 2464Lecturer’s Name : Ms Dorcas Kong

Sickle Cell Anemia

Blood disease is a disorder or disease which will affect one or more parts of the blood , preventing our blood from performing its job in an effective rate . Sometimes , it is also known as blood disorder (Martin , E. A. , ed. , 2010) . Nowadays , there are many types of blood diseases and they are growing public health problems affecting many countries , races and also ethnic groups . They can be classified into acute or chronic . Some of the them are inherited and can cause death . Sickle cell anemia (SCD) is a serious inherited genetic condition which affects the haemoglobin molecule within the red blood cells . It is a condition in which there are lack of healthy and normal red blood cells to carry sufficient oxygen throughout our bodies . The people with sickle cell anemia normally have deformed red blood cells which look like sickles or crescent moons (Mayo Clinic , 2011). This is because the sickle cells contain haemoglobin S or sickle haemoglobin which is an abnormal haemoglobin (MedlinePlus , 2010). The unusual C - shaped cells which look like a farm tool called sickle give the disease its name (CDC , 2011) . The alternative names for sickle cell anemia are sickle cell disease or sickle cell disorder , haemoglobin SS disease and HbS disease (NHLBI. NIH , 2011) . Today , millions of people have been diagnosed with sickle cell disease . This type of blood disease is much more common in Africa and

Mediterranean (PubMed Health , 2012) . About one of every 12 African Americans will carry the sickle cell trait in a person’s genes (MedlinePlus , 2012) . Apart from that , it is estimated that 90 000 to 100 000 people in the United States mainly Blacks or African Americans are affected by sickle cell anemia . About one of every 500 Black newborns and one out of every 36 000 Hispanic-American newborns will have this blood disease (CDC , 2011). There are two risk factors that can increase the chances of getting sickle cell anemia which are inheritance and mutation . First of all , sickle cell anemia is an autosomal recessive genetic blood disease which the sickle cell gene will pass from generation to generation . To have this disease , the defective form of the gene must be inherited to a child from both of the parent . A child will have sickle cell trait if the sickle cell gene is passed from only one parent . A person is known as the carrier of sickle cell anemia if he or she has one normal haemoglobin gene and one defective form of the gene . In addition to , the defective gene can be passed to next generation and affect them . While , if both of the parent are carrier , a 50% chance of getting a child who is carrier , 25% chance of having a child who is normal and another 25% chance of having a child with sickle cell anemia (FamilyDoctor. org , 2006) . Besides , substitution is a kind of gene mutation which cause this blood disease to occur . The gene mutation is caused by the mutagens which are physical or chemical substances that can affects the genetic material of an organism . Hence , the person who always stays in environment with a lot of radiation or mutagen , he or she has higher risk of getting this disease (Gan Wan Yeat , 2010). This type of blood disease can be prevented if the married couples who both carry the sickle cell trait gene do not have any

children . By doing this , the recessive gene will not passed from a generation to another generation . A normal person has haemoglobin A genes which are HbA . If the person who suffers from sickle cell disease , he or she has two haemoglobin S genes (HbS) which are inherited from both parent . These HbS genes are caused by the gene mutation . The base sequence in the DNA for the synthesis of haemoglobin is changed by a single substitution . Hence , the glutamic acid codon is now instead of valine codon (BBC , 2010) . When the oxygen content of an affected person’s blood is low , the sickle cell hameoglobin will aggregate into long rods that deform red cells into a sickle or crescent shape which are abnormal haemoglobin (Reece , J. B. , et. al. , 2011) . Besides , these sickle red blood cells are rigid and sticky . This results in less oxygen is delivered to the body’s tissues (MedlinePlus , 2012) . The symptoms and signs of sickle cell anemia usually become more obvious after an infant is 4 months old and they are varying . The most common symptom of this disease is painful events . They are sudden pain that happens in different parts of the body . This pain is also known as ‘ sickle cell crisis’ . Usually , the sickle cell crises can cause pain in the hands , bones , legs , abdomen and so on . This is because the sickle cell get stuck in the small blood vessel as they travel , interrupting the healthy blood flow (National Marrow Donor Program , 2007) . People who suffer from sickle cell anemia normally have anemia which will make them feel tired and weak . This is caused by the shortage of red blood cells . Furthermore , they will look pale (WebMD , 2010) . Apart from that , the other symptoms of sickle cell anemia may include shortness of breath , blindness , delayed growth , hand-foot syndrome and so on . If it is not

treated , stroke , infections , acute chest syndrome and organ damage are the effects of sickle cell anemia (genomics. energy. gov , 2005) . Bone marrow transplant is the only cure for sickle cell anemia . However , it is difficult to find a donor who is matched with the recipient and the procedure has serious risks and can even cause death . There are many types of treatments for this blood disease including medication. Children with sickle cell anemia can be treated by using antibiotic penicillin in order to help prevent infections . While pain – relieving medications are responsible in relieving pain during sickle cell crisis . The frequency of painful crisis also can be reduced using hydroxyuera . Moreover , blood transfusions are another type of treatments for sickle cell anemia . The blood transfusion can help to relieve anemia by increasing the number of normal blood cells in circulation (Mayo Clinic , 2011) . This is because the sickle shaped cells live only 10 to 20 days which is much shorter than the normal red blood cells . Furthermore , a balanced diet is needed . The supplements of folic acid , vitamin D and zinc should be taken in order to help make new red blood cells . Alcohols and cigarette smokes should be avoided (FamilyDoctor. org , 2006) . As a conclusion , sickle cell anemia is a chronic blood disease that cannot be underestimated . This is because there is no cure for the people with this blood disease . Nevertheless, there are many types of treatments and prognosis can help to prevent further problems which are associated with this blood disease . Prevention is better than cure . Hence , people from all walk of life should working out preventive action to avoid them from getting this severe and rare disease .