

Detecting concentration of Bilirubin in the neonates by using absorption of light

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Hemolytic disease of the newborn or erythroblastosis fetalis occurs when there is an incompatibility between the blood types of the mother and baby. In this condition, red blood cells of the newborn are broken down and destroyed (hemolysis). When the red blood cells break down, a substance called bilirubin is formed. The Bilirubin has a pigment or coloring, it causes a yellowing of the baby's skin and tissues. This is called hyperbilirubinemia. The hyperbilirubinemia reflects is a normal phenomenon for infants. However, in some infants, bilirubin levels may rise excessively, which is very dangerous and immediately requires medical attention. because this disease can cause seizures, brain damage, deafness, and death. For these reasons, the presence of neonatal jaundice frequently results in diagnostic evaluation. The objective of this research is to develop test kit for detecting concentration of Bilirubin by using absorption of light. This work is separated into 2 parts. In the first parts, choosing filter paper that could absorb the plasma to clearly show bilirubin was studied. We found that the paper - MF1 is the best filter paper to use in our test kit. The second part, finding relation between concentration of bilirubin and absorbing RGB values by programming RGB color sensor and assembling microcontroller devices were explored. We found that the relation between concentration of standard Bilirubin solution and the B value can be fitted with equation as $y = 13.7\ln(x) + 9.356$ which x is the concentration of Bilirubin and y is B value. Besides, our device can detect the concentration of Bilirubin in range of 0-10 mg/dl.

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