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PERCEPTION OF TIRED BLOOD AND ITS CAUSES USING MINING TECHNIQUES

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ABSTRACT

The widespread availability of new computational methods and tools for data analysis and predictive modeling requires medical informatics researchers and practitioners to systematically select the most appropriate strategy to cope with clinical prediction problems. In particular, the collection of methods known as 'data mining' offers methodological and technical solutions to deal with the analysis of medical data and construction of prediction models. Recent progress in data mining research has led to the developments of numerous efficient and scalable methods for mining interesting patterns and knowledge in large databases, ranging from efficient classification methods to clustering, outlier analysis, frequent, sequential and structured pattern analysis methods, and visualization and spatial/temporal data analysis tools.

KEYWORDS: Machine learning algorithm, CHC, CBC, Anemia, Tired Blood,WEKA.

INTRODUCTION

The data mining is a relatively new field of research whose major objective is to acquire knowledge from large amounts of data. In medical and health care areas, due to regulations and due to the availability of computers, a large amount of data is becoming available. Anemia is defined as a reduction in the number of circulating red blood cells, the hemoglobin concentration, or the volume of packed red cells in the blood. Anemia is a public health problem affecting most of the children and pregnant women. In India, anemia is the second most common cause of maternal deaths, accounting for 20% of total maternal deaths. Anemia can be measured by monitoring hemoglobin concentration. The classification of anemia can be done by using various classification schemes with the help of data mining techniques. It was infected in developing and developed countries .The aim of this study was to assess the prevalence and risk factors for anemia in pregnant women.

Anemia and approaches

Anemia is a decrease in normal number of red blood cells (RBCs) or less than the normal quantity of haemoglobin in the blood. Anemia is the most common disorder of the blood. There are several kinds of anemia, produced by a variety of underlying causes. Anemia can be classified in a variety of ways, based on the morphology of RBCs, underlying etiologic mechanisms, and discernible clinical spectra, to mention a few. The three main classes of anemia include excessive blood loss, excessive blood cell destruction or deficient red blood cell production. Various approaches can be used to detect anemia with help of classifiers.

Assessing anemia

- Family or personal history of anemia
- A history of gallbladder disease, jaundice, or enlarged spleen
- Heavy menstrual bleeding.
- Any occurrence of blood in the stool or other signs of internal bleeding. (Even if the patient has not observed any bleeding, nonvisible blood may be present, so a rectal exam and stool test are essential.)
- Dietary history, particularly in people who are elderly, poor, or both

Age Groups and Measurement of Anemia

- Newborns: 17 to 22 gm/dL
- One (1) week of age: 15 to 20 gm/dL
- One (1) month of age: 11 to 15gm/dL
- Children: 11 to 13 gm/dL
- Adult males: 14 to 18 gm/dL
- Adult women: 12 to 16 gm/dL
- Men after middle age: 12.4 to 14.9 gm/dL
- Women after middle age: 11.7 to 13.8 gm/dL

TYPES OF ANEMIA

Three distinct stages of severe anemia have been recognized - compensated, compensated, and that associated with circulatory failure. Anemia can be

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normally classified into three categories namely known as mild anemia, moderate anemia, severe anemia.

Mild anemia
Menstrual bleeding or iron deficiency tends to cause mild chronic anemia with symptoms of fatigue, pallor (pale skin colour), and weakness. If anemia is due to major blood loss, such as in cases of severe GI bleeding caused by ulcers it causes dizzy and very weak, especially stand up suddenly.

- Mild anemia is considered when hemoglobin is between 9.5 - 13.0 g/dL

Moderate anemia
Women with moderate anemia have substantial reduction in work capacity and may find it difficult to cope with household chores and child care. They are more susceptible to infections and recovery from infections may be prolonged. Premature Births are more common in women with moderate anemia. They deliver infants with lower birth weight and prenatal mortality is higher. They may not be able to bear blood loss prior to or during labor and may succumb to infections more readily. Substantial proportion of maternal deaths due to ante partum and post-partum hemorrhage, pregnancy Induced hypertension and sepsis occur in women with moderate anemia.

- Moderate anemia is considered when hemoglobin is between 8.0 - 9.5 g/dL

Severe anemia
The cardiac output is raised even at rest, the stroke volume is larger and the heart rate is increased. Palpitation and breathlessness even at rest are symptoms of these changes. These compensatory mechanisms are inadequate to deal with the decrease in Hb levels. Oxygen lack results in anaerobic metabolism and lactic acid accumulation occurs. Eventually circulatory failure occurs further restricting work output.

- Severe anemia is considered for hemoglobin concentrations below 8.0 g/dL

IDA and Its Causes
Iron-deficiency anemia is a common anemia caused by insufficient dietary intake and absorption of iron, and/or iron loss from bleeding. Iron deficiency causes approximately half of all anemia cases worldwide, and affects women more often than men.

- The body does not make enough red blood cells
- Bleeding causes loss of red blood cells more quickly than they can be replaced

Iron deficiency anemia symptoms
Without enough iron, our body starts using the iron it has stored. Soon, the stored iron gets used up. After the stored iron is gone, our body makes fewer red blood cells. The red blood cells it does make have less hemoglobin than normal. Extreme tiredness, Pale skin, Weakness, Shortness of breath, Chest pain, Frequent Infections, Headache, Dizziness or light-headedness, Cold hands and feet, Inflammation or soreness of your tongue, Brittle nails, Fast heartbeat, Unusual cravings for non-nutritive substances, such as ice, dirt or starch, Poor appetite, especially in infants and children with iron deficiency anemia, An uncomfortable tingling or restless legs syndrome. Iron deficiency anemia may lead to a rapid or irregular heartbeat. our heart must pump more blood to compensate for the lack of oxygen carried in our blood when anemic. This can lead to an enlarged heart or heart failure.

ANEMIC DURING PREGNANCY

Problems during pregnancy. In pregnant women, severe iron deficiency anemia has been linked to premature births and low birth weight babies. But the condition is preventable in pregnant women who receive iron supplements as part of their prenatal care.

Types of Anemia during Pregnancy
Several types of anemia can develop during pregnancy. These include:

- Iron-deficiency anemia
- Folate-deficiency anemia
- Vitamin B12 deficiency

Iron-deficiency anemia
This type of anemia occurs when the body doesn't have enough iron to produce adequate amounts of hemoglobin. That's a protein in red blood cells. It carries oxygen from the lungs to the rest of the body. In iron-deficiency anemia, the blood cannot carry enough oxygen to tissues throughout the body. Iron deficiency is the most common cause of anemia in pregnancy.

Folate-deficiency anemia
Folate, also called folic acid, is a type of B vitamin. The body needs folate to produce new cells, including healthy red blood cells. During pregnancy, women need extra folate. But sometimes they don't get enough from their diet. When that happens, the body can't make enough normal red blood cells to transport oxygen to tissues throughout the body. Folate deficiency can directly contribute to certain types of

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birth defects, such as neural tube abnormalities (spin bifida) and low birth weight.

Vitamin B12 deficiency
The body needs vitamin B12 to form healthy red blood cells. When a pregnant woman doesn't get enough vitamin B12 from her diet, her body can't produce enough healthy red blood cells. Women who don't eat meat, poultry, dairy products, and eggs have a greater risk of developing vitamin B12 deficiency, which may contribute to birth defects, such as neural tube abnormalities, and could lead to preterm labor. Blood loss during and after delivery can also cause anemia.

Risk Factors for Anemia in Pregnancy
All pregnant women are at risk for becoming anemic. That's because they need more iron and folic acid than usual. But the risk is higher they are:

- Are pregnant with multiples (more than one child)
- Have had two pregnancies close together
- Vomit a lot because of morning sickness
- Are a pregnant teenager
- Don't eat enough foods that are rich in iron

Untreated folate deficiency can increase risk of having :

- Preterm or low-birth-weight baby
- Baby with a serious birth defect of the spine or brain (neural tube defects)

Untreated vitamin B12 deficiency can also raise your risk of having a baby with neural tube defects.

Trimester	Hemoglobin (g/dL)	Hematocrit (%)
First	**<11**	**<33**
Second	**<10.5**	**<32**
Third	**<11**	**<33**

Symptoms of Anemia during Pregnancy
The most common symptoms of anemia during pregnancy are:

- Pale skin, lips, and nails
- Feeling tired or weak
- Dizziness
- Shortness of breath
- Rapid heartbeat
- Trouble concentrating

Anemia criteria for the specific stage of pregnancy are:
Anemia is defined as Hb less than the lower limit of the reference range for age:

Age	Lower limit of normal range of Hb (g/l)
2 months	90
2 - 6 months	95
6 - 24 months	105
2 - 11 years	115
> 12 years	girls – 120 boys - 130

Tests for Anemia
During the first prenatal appointment, they get a blood test so the doctor can check whether we have anemia. Blood tests typically include:

- Hemoglobin test. It measures the amount of hemoglobin an iron rich protein in red blood cells that carries oxygen from the lungs to tissues in the body.
- Hematocrit test. It measures the percentage of red blood cells in a sample of blood.

If the patient have lower than normal levels of hemoglobin or hematocrit, then it causes iron-deficiency anemia.

PREVENTION FOR TIRED BLOOD

Prevention and management of anemia in pregnancy
In view of the high prevalence of anemia in pregnancy and serious adverse consequences in both mother and baby, management of anemia in pregnancy was accorded a very high priority both in obstetric and public health practice. Mandatory monthly screening for anemia became the 'routine' in all antenatal clinics. Skilled management of severe grades of anemia detected late in pregnancy, through blood transfusion and parenteral iron therapy became the hallmark of good obstetric practice and resulted in maternal and parental salvage rates in hospitals.

CONCLUSION

Screening for anaemia in pregnancy is useful for a variety of reasons. It may be helpful to collect baseline data on prevalence and severity in a g population. Using single data mining technique in the diagnosis of many health problems has been comprehensively investigated showing acceptable levels of accuracy. We investigate the issues of iron deficiency and perform various tests to predict the anemic patients. In

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future we apply this datasets to machine learning tool to predict the final results accurately with the help of WEKA tool.

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