

BLUE BABY SYNDROME

Ms. Nandni Shivhare

1. Nursing tutor, Child Health Nursing Department, Rama college of Nursing, Rama University, Mandhana, Kanpur

ABSTRACT

Blue baby syndrome, also called as generally blue baby, is a word used to define infants along with cyanosis, or blue-tinted skin. The situation grows when the organs, cells and tissues do not take enough oxygen, and the tissue starts to change blue in color rather than pink and showing poor oxygen levels. Although this syndrome can be deadly if left is not treated, modern therapies can generally precise the problem. It happens most commonly in infants less than six months of age, but it can also pretend older children and adults, in unique cases. The blue baby syndrome (methemoglobinemia) associated to increase nitrate levels in drinking water, still extremes in Eastern Europe and the United states, however has a comparatively decrease prevalence in the countries of Western Europe. It is not likely to fully inhibit the blue baby syndrome. But some cares through pregnancy and after childbirth might decrease the risk of the situation. Blue baby syndrome could be recovered or need long term management. Situations such as methemoglobinemia frequently cure on their own as the baby's body becomes adjust at handling nitrate and nitrite. Be active to variation in skin color and other symptoms can help in early detection and periodically treatment of the blue baby syndrome.

Keywords- Blue Baby Syndrome, Methemoglobinemia, heart defect, cyanosis.

INTRODUCTION-

Infant methemoglobinemia is known as Blue Baby syndrome, is a situation where skin of a baby becomes blue. This happens in view of reduced the amount of hemoglobin in the baby's blood. It's represented by an overall skin color with a blue or purple tinge, called as cyanosis. This bluish visible is much observable where the skin is thin, such as the lips, earlobes and also nail beds.¹

Historically, the word **Blue Baby Syndrome** has mentioned to babies with one of two situations: cyanotic heart disease, which is a classification of congenital heart defect that effects in low blood oxygen level. This can refers to caused by either decreased blood flow to the lungs or mixture of oxygenated and deoxygenated blood. Blue baby syndrome, when not general, can happen due to many congenital heart defects or environmental or genetic factors.²

DEFINITION-

In Greek, 'cyanoses' exactly means 'dark blue'. The blue tinge is caused by deficiency of oxygen, and de-oxygenated blood moving in the body. Blue baby syndrome is a almost deadly situation that happens when the hemoglobin (Fe.sup.2+) in an infant's red blood cells is oxidized to methemoglobin (Fe.sup.3+).³

CAUSES

The baby captures on a bluish colour where as badly oxygenated blood. Generally, blood is pushed from the heart to the lungs, where it takes oxygen. The blood is transferred back by the heart and then all over the body.

While there is an issue with the heart, lungs and blood, blood may not be oxygenated correctly. This effect the skin to get on a blue color. The absence of oxygenation can happen for several reasons.⁴

- **Tetralogy of Fallot (TOF)** - when a unique congenital heart defect, TOF is an earliest cause of blue baby syndrome. It is genuinely a conjunction of four heart defects that can decrease blood flow to the lungs and provide oxygen-poor blood to flow out into the body.

TOF involves in a state like having a gap in the wall that divides the left and right ventricles of the heart and a muscle obstructing the flow of blood from the right ventricle into the pulmonary otherwise lung, artery.

- **Methemoglobinemia-** This situation arises from nitrate poisoning. it is can occur in babies who are provided infant formula mixed with fine water or homemade baby food formed with nitrate-rich foods, like spinach or beets. The situation happens most generally in babies less than 6 months of age. When this young, babies have extra sensitive and underdeveloped gastrointestinal tracts, which are more feasible to transform nitrate into nitrite. As nitrite spread in the body, it originates methemoglobin. While methemoglobin is a rich of oxygen, it does not lose that oxygen into the bloodstream. This allows babies with the situation their bluish colour. Methemoglobinemia can be hardly congenital too.⁵

Other congenital heart defects-

- Down syndrome
- Type 2 diabetes mellitus
- Cyanosis is caused by some congenital heart defect.

SYMPTOMS

The main symptoms are bluish colour of the skin and some other additional symptom of blue baby syndrome includes:⁶

- Difficulty in feeding
- Irritability
- Lethargy
- Unable to gain weight
- Problem in developmental
- Heartbeat or breathing feels fast
- Clubbed or rounded fingers and toes
- Gums and tongue may turn blue
- Poor growth
- Loss of consciousness

DIAGNOSIS

For diagnose the blue baby syndrome. We have to do:-

- History collection
- physical exam,

Tests can include:

- Blood tests
- Chest X-ray to determine the size of the heart and lungs
- Electrocardiogram (EKG) to observe at the electrical motion of the heart
- For look the anatomy of the heart to do Echocardiogram
- To imagine the arteries of the heart to do Cardiac Catheterization
- Oxygen saturation test to check the level of oxygen in the blood

- Blood gas analysis.⁷
- Genetic testing is performed, if congenital disease is suspected.

TREATMENT

The treatment for blue baby syndrome based only on the diagnostic evaluation. As look before there is a large range of basis for this disease so that the treatment may vary broadly.

1. **Medication and oxygen therapy-** It helps to decrease the chance of heart defect. Medicines help heart to do better and help in decreasing the impact of heart defects. This is also administered with oxygen to develop the oxygen levels in the blood.
2. **Heart surgery-** It is act to improve the defects in the heart. Based on the cruelty of the heart defect baby may need the surgery quickly or at the later age. There are some surgeries are basically perform to the heart:-

A. Surgery for TOF- It is open heart surgery known as Blalock-Thomas-Taussing shunt. It is done for the total correction of the heart.

B. Surgery for transportation of the great arteries (TGA) - This surgical planning is also familiar as Balloon Atrial Septostomy.⁸

3. **Medication for methemoglobinemia-** Like Methylene which promotes the oxygen carrying capacity of the blood.

4. **Nutrient supplementation-** Supplementation with vitamins as well as vitamin C or ascorbic acid might help to decrease the consequences of nitrate and nitrite.

5. **Blood Transfusion-** In case of breath holding spells, some vitamin supplementations and the behavioral management advices are given to the parents. If the methemoglobin levels in the blood are very elevated then the doctor advice the exchange of the oxygenated blood.

6. **Control diabetes-** This is one of the better methods to control blue baby syndrome. If you have any antenatal diabetes that should be managed properly. If diabetes throughout the pregnancy is not treated properly it badly affects your baby.

7. **Avoid nitrates rich food-** Avoid the foods that are rich in nitrates like broccoli, spinach, beetroots, and carrots. Restrain these foods till your baby transforms 7 years old. It is prime to use them in the frozen state rather than fresh.

8. **Avoid nitrate contaminated water-** Refuse to take nitrate contaminated water is the better way to cope of this blue baby syndrome. If there is no option for take other water source than better to take distal water which is available in grocery store. Do not make baby formula with well water or yield the well water to the babies till the age of 12 months. Boiling water cannot take out the nitrates in the water and nitrate substance should not pass 10 mg/L.⁹

Conclusion

In Greek, 'cyanoses' exactly means 'dark blue'. Historically, the word blue baby syndrome has mentioned to babies with one of two situations: cyanotic heart disease, which is a classification of congenital heart defect that effects in low blood oxygen level. Infant methemoglobinemia is known as blue baby syndrome, is a situation where skin of a

baby becomes blue. This happens in view of reduced the amount of hemoglobin in the baby's blood. It caused by some reasons like TOF, methemoglobinemia, Down syndrome, diabetes mellitus, cyanosis. For investigate the blue baby syndrome we should check - history collection, physical exam, blood tests, chest x-ray to determine the size of the heart and lungs, electrocardiogram, observe at the electrical motion of the heart, echocardiogram, cardiac catheterization, check the level of oxygen in the blood, blood gas analysis. The treatment for blue baby syndrome based only on the diagnostic evaluation. As look before there is a large range of basis for this disease so that the treatment may vary broadly- medication and oxygen therapy, heart surgery, medication for methemoglobinemia, nutrient supplementation, blood transfusion, control diabetes, avoid nitrates rich food, avoid nitrate contaminated water. This treatment can prevent the disease of blue baby.

REFERENCES

1. "Cyanotic heart disease: Medline plus Medical Encyclopedia". Medlineplus.gov. Retrieved 29 October 2020.
2. Majumdar Deepanjan (2003). "The Blue Baby Syndrome". *Resonance*. 8 (10): 20–30.
3. "Blue discoloration of the skin: Medline Plus Medical Encyclopedia
4. [wikipedia.org/wiki/Blue_baby_syndrome](https://www.wikipedia.org/wiki/Blue_baby_syndrome)
5. "Symptoms and Diagnosis of Congenital Heart Defects". [ww.heart.org](http://www.heart.org). Retrieved 13 November 2019.
6. McMullen, Sarah M.; Patrick, Ward (2013). "Cyanosis". *The American Journal of Medicine*. **126** (3): 210–212.
- 7 Snider, H. L. (1990), Walker, H. Kenneth; Hall, W. Dallas; Hurst, J. Willis (eds.), "Cyanosis", *Clinical Methods: The History, Physical, and Laboratory Examinations* (3rd ed.), Butterworths,
- 8 Da-Silva, Shonola S.; Sajan, Imran S.; Underwood, Joseph P. (1 August 2003). "Congenital Methemoglobinemia: A Rare Cause of Cyanosis in the Newborn—A Case Report". *Pediatrics*. **112** (2): e158–e161.
- 9 CDC (19 November 2019). "Congenital Heart Defects - Facts about Tetralogy of Fallot | CDC". *Centers for Disease Control and Prevention*. Retrieved 20 November 2019.