Polycythemia

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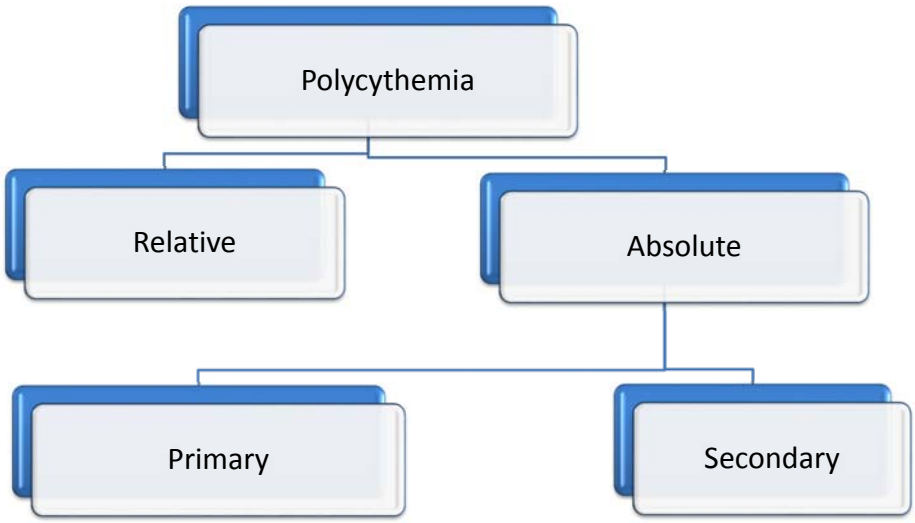
Polycythemia

Definition

Polycythemia is the increase of RBCs count above the normal upper limit specific for each animal species. There are two types of polycythemia, which are relative and absolute polycythemia.



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1. Relative (apparent) polycythemia

It is an apparent or relative increase of RBCs count due to loss of fluids from the body.

The increase of RBCs count in case of relative polycythemia is temporary, as the RBCs count is returned to normal after correcting the loss of body fluids.

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Causes of relative Polycythemia:

1. Hemoconcentration as in cases of diarrhea, diuresis, excessive vomiting or shock (shift of fluid form plasma to the interstitium).
2. Excitement, which results in release of epinephrine that stimulate contraction of the spleen.

Laboratory findings in relative Polycythemia:

1. Increase total RBCs count, hemoglobin concentration and PCV %.
2. Decrease plasma volume.
3. Increase plasma protein level.
4. Normal erythropoietin level.

II. Absolute (true) Polycythemia

It is a persistent increase in total RBCs count.

Absolute Polycythemia may be primary or secondary.

It may be either:

1- Primary Polycythemia.

2- Secondary Polycythemia.

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1- Primary Polycythemia

(Polycythemia Vera or erythremia)

Definition

Primary Polycythemia occurs due to hyperplasia of the bone marrow, or presence of tumor at the bone marrow, which results in increased synthesis of RBCs.

Causes

- Excessive erythroplastic activity of the bone marrow (hyperplasia of hemopoietic tissues of the bone marrow).
- Unknown causes.

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Secondary Polycythemia

- Secondary polycythemia occur in any case characterized by hypoxia or hinder the proper oxygenation of blood.
- Erythrocytosis should be regarded as a conservative vital reaction i.e. an effort on the part of the organism to compensate for some difficulty in the oxygenation of blood and tissues of the body.

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Secondary Polycythemia appears following hypoxic stimulation of the bone marrow under the following conditions:

- Exposure to high altitude.
- Any disease that interferes with the oxygenation of the erythrocytes as in obstructive lesion in air passage ways.
- Renal diseases that characterized by overproduction of Erythropoietin.
- Chronic diseases of the heart.

Laboratory findings in Absolute Polycythemia:

1. Increased total RBCs count, hemoglobin concentration and PCV %.
2. Normal blood total protein level and its fractions.
3. Normal blood urea nitrogen level.
4. High erythropoietin level.
5. Decrease Po_2 in case of hypoxia.