Intrinsic Factors

Intrinsic Factor Definition – internal factors affecting the body and how it functions. Internal pacemaker from rhythmic contraction of Sinoatrial node (SA) sets the rate of beating.

Central Nervous System – Heart rate can be affected by emotions (fear, arousal) that increase HR and BP, and sleep that decreases both.

Autonomic Nervous System: Sympathetic Nervous System – Sympathetic nerves are in the myocardium. Stimulation releases norepinephrine causing FHR to increase. Increases vigor, output, and are a reserve mechanism to improve pumping during stressful situations.

Autonomic Nervous System: Parasympathetic Nervous System – Vagus nerve from the brain stimulates the SA (sinoatrial) and AV (atrioventricular) nodes in the heart. Stimulation here decreases FHR. Blocking this nerve increases FHR. Vagus nerve responsible for transmitting beat-to-beat variability of FHR.

Baroreceptors: Homeostatic Mechanism – Stretch receptors in aorta and arteries that are sensitive to increases in BP. When BP rises messages sent to brain to slow heart rate and output almost instantly.

Chemoreceptors – Found in nervous system, respond to changes in blood gases (O2 and carbon dioxide), when Os decreases or carbon dioxide increases the body reacts with tachycardia (speeding up the heart, and increasing BP circulating more oxygenated blood through the body.

Hormonal Influences – epinephrine and norepinephrine in response to stress, angiotensin II in circulatory regulation and during hemorrhagic stress, vasopressin affects distribution of blood flow especially during hypoxia and other stressful situations, prostaglandins like Arachidonic acid metabolites regulate umbilical blood flow and maintains patency of ductus arteriosus, others are part of circulatory regulation

FHR Control/ Gestational Age – 20wks gestation 155bpm, 30wks 144bpm, term 140bpm, can vary 20bpm above or below

Fetal Behavioral States/ Labor Influences – Fetuses don't seem to react to shifts in maternal blood volume. They can be deprived of oxygen for a longer time than adults before permanent brain damage sets in. Stillbirth may be caused by inadequate gas exchange in the blood through the placenta. Carbon dioxide crosses the placenta easier than oxygen. Cord compression can decrease blood flow and oxygen to the fetus. Uterine contractions influence the fetus.

References

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