

Regulation Mechanisms of Blood Flow in Organs

Overview (Over-sperm)

In human body each organ has ability to control its own local blood flow in proportion to its metabolic needs. There are variations in blood flow in different organs like in brain, heart, kidneys, liver and etc. For example: the brain is responsible for receive and send messages from sensory organs to motor ones, for this it needs to have a good support from oxygen and nutrients.



Specific needs of the organs for blood flow

The organs receive from blood O_2 , nutrients; remove CO_2 and H^+ ; maintenance of proper concentrations of other ions and transport of various hormones and other substances to the different tissues.

Mechanisms of blood flow control

Blood flow into organs depends on the blood pressure, high blood pressure causes the blood vessels to stretch(constrict) therefore, little blood will flow into the vessel branches and little amount of blood will get to the organ supplied by that vessel. on the other hand, low blood pressure has the same effect because blood flow will be too slow. normal blood pressure(about 120/80mm Hg) is the required pressure for the body systems to work appropriately. There are two phases of blood flow control short-term(basically due to baroreceptor reflex) and long-term control(basically due to hormonal control). They differ among them for example in duration. In certain conditions one of the phases (e.g.short-term) can be switched on and if the organism's normal functioning is not restored, the other phase can then be activated, they compensate each other.

Short-term control

- rapid changes in local vasodilation or vasoconstriction (arterioles, metarterioles, and precapillary sphincters)
- seconds to minutes

Long-term control

- result of a increase or decrease in the physical sizes and numbers of actual blood vessels
- over a period of days, weeks, or months

Conclusion

To ensure the proper functioning of the organs they make their own control of nutrients, oxygen and removal of metabolic waste. This control is divided into two phases. The first has a shorter duration (short-term) and acts at the level of the capillary sphincters (vasodilation or vasoconstriction, depending on the situation), on the other hand the long-term has a longer duration and resulted in increased or decreased of blood vessels for a given organ. The lack of oxygen is received by receptors who send the message to the hypothalamus, the hypothalamus to the spinal cord and then to the heart and blood vessels.

Bibliography

- Guyton & Hall Handbook
- <http://www.apps.org.au/Proceedings/32-1/dampney/dampney.pdf>
- <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1355131/pdf/annsurg00264-0082.pdf>
- <http://www.cvphysiology.com/Blood%20Flow/BF003.htm>