NAME: EGBE AMANDA OGHOSA

MATRIC NO: 18/ENG08/005

DEPARTMENT: BIOMEDICAL ENGINEERING

ASSIGNMENT:

Discuss the Physiology of Balance

ANSWER:

THE PHYSIOLGY OF BALANCE

The Physiology or Sense of balance (or equilibrioception) is the perception of balance and spatial orientation. It is the physiology or sense that keeps humans and even animals from falling over when standing or moving. The Physiology of Balance works as a result of a number of sensory systems working together.

THE SENSORY SYSTEMS

These systems includes: the visual system (the eyes), the vestibular system (the inner ears), and proprioception (which is the body's sense of where it is in space).

The vestibular system which includes the region of the inner ear where three semi-circular canals converge, works with the visual system to keep objects in focus when the head is moving. This is called the vestibulo-ocular reflex (VOR).

The balance system works with the visual and skeletal systems (the muscles and joints and their sensors) to maintain orientation or balance. Visual signals sent to the brain about the body's position in relation to its surroundings are processed by the brain and compared to information from the vestibular and skeletal systems.

It should be noted that in the vestibular system, physiology of balance is determined by the level of a fluid called endolymph in the labyrinth, a complex set of tubing in the inner ear.

WHAT HAPPENS IF THE PHYSIOLOGY OF BALANCE IS INTERRUPTED? (Dysfunction)

If the sense of balance is upset or interrupted, it will result in dizziness, disorientation and nausea.

WHAT CAN INTERRUPT BALANCE?

- Balance can be upset by Ménière's disease, superior canal dehiscence syndrome, an inner ear infection.
- By a bad common cold affecting the head or a number of other medical conditions including but not limited to vertigo.
- It can also be temporarily disturbed by quick or prolonged acceleration, for example riding on a merry-go-round.
- Blows can also affect equilibrioreception, especially those to the side of the head or directly to the ear.

MORE ON THE VESTIBULAR SYSTEM:

As already stated, the vestibular system is the sensory system that includes the inner ear which aids the body maintain its postural equilibrium. The vestibular system is essential for coordinating the position of the head and the movement of the eyes.

There are two sets of end organs in the inner ear (also called the labyrinth); they are:

- The semi-circular canals, which provides response to rotational movements (angular acceleration);
- The utricle and saccule within the vestibule, which respond to changes in the position of the head with respect to gravity (linear acceleration).

The information these organs deliver is proprioceptive in character, dealing with events within the body itself, rather than exteroceptive, dealing with events outside the body, as in the case of the responses of the cochlea to sound.

In terms of their functions these organs are closely related to the cerebellum and to the reflex centres of the spinal cord and brainstem that govern the movements of the eyes, neck, and limbs.

In vertebrates the utricular maculae in the inner ear contain an otolithic membrane and otoconia (particles of calcium carbonate) that bend hair cells in the direction of gravity. This response to gravitational pull helps animals maintain their sense of balance.