Maintaining The Internal Environment-homeostasis And Its Relationship With Down Syndrome

Rationale

In a research investigation published to the journal of biomedical science, authors Ambreen Asim, Ashok Kumar, Srinivasan Muthuswamy, Shalu Jain & Sarita Agarwal, investigated Down syndrome and the diseases associated with it. Drawn from their investigation, the research question ‘Do the associated diseases and side affects of down syndrome disrupt an individuals homeostasis?’.

Background information:

Down syndrome is a genetic disorder and chromosomal condition that affects an individual’s facial characteristics, their muscle tone (viable in infancy), slower development in childhood and the individuals’ cognitive function may be compromised due to down syndrome. Chromosomes are DNA molecules that are packaged into a thread or string like structure, that is in the nucleus of each cell. This tiny structure called a chromosome, determines how we will develop as it carries our genes. In most people, our cells usually contain 23 pairs of chromosomes, but in those who have down syndrome, the pairs of chromones do not divide correctly. This failed division of chromosomal pairs leads to an infant’s cells to have too many chromosomes as there is an extra chromosome 21. This extra 21 chromosome also gives down syndrome the other name ‘trisomy 21’. Many issues come with Down syndrome such as leukaemia, congenital heart diseases, cancers, Alzheimer’s and hirschprung disease.

Our body is a machine that does things without us even thinking about it. When it’s summer, your body regulates itself and cools you off and when it’s winter your body acclimates to this moving blood around the body to warm you. The body takes in all of the information and reacts accordingly when we drink water, eat a fatty meal, or run around for a while, your body stays fairly normal and it’s composition doesn’t change completely. This regulation of the body and proccess is called homeostasis. Homeostasis refers to the regulation of a body’s internal activity and environment and the stability that is mainted and consistent.

This homeostatic activity and the basis of the concept of homeostasis is referring to a genetically average body with the right about of chromosomes and genetic material. So a person who has downsyndrown does not fit into that category, meaning the extra chromosomal material would have an effect on the entire physiological activity of the body. It’s like coding, meaning that a genetically average body has a certain set of coding and runs a specific way, but if a single number is changed in the coding, the operation of the body and it’s systems response changes.

Evidence

Many complications occur in a person who has down syndrome some of which do not be come visible until an older age. There are several common complications associated with Down

syndrome which include heart defects, immune disorders, gastrointestinal defects, obesity, sleep apnea, lekemia, spinal problems, endocrine issues and Dementia. Focusing closer on a select few of the complications associated with Down syndrome, heart defects, immune disorders and obesity are fairly common complications.

Congenital heart disease is a complication in the structure of a persons heart that is visible at birth. The walls, veins, arteries and valves in and near the heart can disrupt the regular flow of blood in and throughout the heart. The flow of blood in the heart slows down or go in the wrong area or direction of the heart or the valves can become completely blocked.

It is one of the most common birth defects and for every 1000 births there are estimated to be 8 to 10 baby's are born with congenital heart defects. Congenital heart defects are the leads cause of deaths in infants and baby related to birth defects. Although the mortality rate isn't exceptionally high it is still saddening as in 1999 to 2006 there were 41 494 death that were cause because of congenital heart defects meaning that the heart defect was the main cause of the infants death or a major contributing factor to their death. Although congenital heart defects are not a specifically genetic defects, at a minimum 15% of congenital heart defects are associated with genetic disorders and conditions and statistically 54% of infants with Down syndrome are diagnosed with any type of congenital heart defect. Although the risk of congenital heart defects have decreased by almost 40% in recent years, the disruption of homeostasis due to heart defects is still a risk regardless. There are several ways congenital heart defects can disrupt homeostasis as the disruption of blood flow and and the circulatory system of the body disrupt the balance of the body's inner workings. Essential nutrients, materials and chemicals are transported through the body to different organs and systems in the body by way of the plasma and blood. The circulatory system not only delivers important materials and such to different organs and systems of the body but aids in the expulsion of the waste that are a byproduct of the cells apart of the metabolic process. These crucial import and export process are crucial in maintenance of the body. If disturbed, the body can fail to complete the crucial processes that sustain the body or if the waste isn't expelled from the body, it builds ups and could cause metabolic poisoning or diseases may develop.

- blood not going to the right places when cold
- signalling pathways
- essential chemicals and nutrients being transported
- waste transportation in metabolism removal

References

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