Differences between the Adult and the Infant Endocrine System

Name

Institution

Differences between the Adult and the Infant Endocrine System

The endocrine system is a complex amalgamation of hormone secreting glands that are spread across the body. Since they are interconnected, the glands affect nearly each cell and the manner in which the body functions. The glands work in sync to control emotions, growth of the body, tissue function and sexual growth. The endocrine system of a body is quite different from that of a child and this explains why there are fundamental differences between the body of an infant and that of an adult. This paper examines the difference between the endocrine system of an adult and that of an infant.

One of the major glands of the endocrine system is the adrenal glands. The adrenal gland is located on top of each kidney and is tasked with controlling metabolism, kidney function, blood pressure, heart movements and the manner in which the body responds to stress. This gland is also responsible for controlling the immune system as well as the sexual growth and activity. The gland is also responsible for controlling the impacts of insulin in breaking down body sugars for energy (Crews & McLachlan, 2006).

The adrenal glands in infants are quite different from that of adults. In infants, the adrenal weigh .29% of the total body weight which is quite extraordinary when compared with the adult glands which are only .014% of the total body weight. The adrenal glands keep on shrinking with the passage of time and by the third week after birth the total mass reduces by 50% of its total weight. Despite its large size, the adrenal system in young children is not well developed and hence the child cannot do most of the things that adults are capable of doing. The adrenal glands in young children only control hormones that help in controlling the body metabolic system but

as time passes, the glands begin producing hormones that make certain parts of the body such as the breasts and the beard to enlarge. In most cases, the functions of the adrenal glands in children is quite similar to those of adults save for the type of hormones that are produced in different stages of life (Crews & McLachlan, 2006).

Another major part of the endocrine system is the gonad glands. The gonads are placed on either side of the ovaries in females while in males it is located in the scrotum. In the adult female, the gonads are responsible for secreting estrogen and progesterone while in male adults it is responsible for the production of testosterone. The major difference between the gonads in infants and adults is that infants the glands are only present but do not play any major role. In infants, the gonads are in a passive state until the puberty stage when the ovaries start inducing female sexual traits such as the growth of the breasts and an accumulation of body fat around the thighs. In males, the production of testosterone leads to the maturation of the penis and the deepening of the voice. The differences between the infant and the adult gonads explain why the sexual reproductive system in children is not developed as compared to that of adults (Landrigan & Garg, 2013).

Another part of the endocrine system that presents stark differences between infants and adults is the hypothalamus. The thymus in infants in infants is larger as compared to the thymus in adults. The reason for this is because it develops through the adolescent years to support the growth that is noticeable during the pre-adolescent period. The thymus then starts to shrink during adulthood since the body at this stage has reached its peak. Apart from the hypothalamus, the pancreas is also an important part of the endocrine system. This gland is responsible for regulating the sugar levels in the body. Ideally, the infant pancreas is low in beta cell thus

making it to work normally. As the individual continues to grow, there is however a proliferation of the beta cells something that makes the adult more prone to diseases such as diabetes (Landrigan & Garg, 2013).

Another difference in the infant and the adult endocrine system is seen in the pituitary gland. In infants, the kids are highly sensitive but this sensitivity decrease as the individual keeps on aging. This decrease in sensitivity is linked to the decrease in osmolality of renal medullary tissue. At birth, the pituitary glands are able to hold water for longer periods and hence infants are less likely to pass urine than adults. This however keeps on changing and by adulthood the water retention capability of the pituitary gland is greatly diminished thus making it harder for them to retain water for longer periods of time. There is also a great difference between the thymus gland in children and adults something that leads to major differences between the two (Nydegger, et al., 2007. The thymus gland is placed in the chest beneath the breastbone and is responsible for producing the hormone thymosin. This hormone is responsible for the growth of the body's immune system and since the gland is underdeveloped in infants, they tend to be more prone to infections than adults (Landrigan & Garg, 2013).

References

Crews, D., & McLachlan, E. (2006). Evolution, endocrine disruption, health and disease. *Endocrinology 147*(6) S4S10.

Landrigan, P., & Garg, D. (2013). Assessing the effects of endocrine disruptors in the National Children's Study. *Environmental Health Perspectives, 111*(13), 1678.

Nydegger, A., et al. (2007). Changing incidence of acute pancreatitis: 10-year experience at the Royal Children's Hospital, Melbourne. *J Gastroenterol Hepatol 22*, 1313– 1316.