Significance of the Brain Barrier System

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It is quite astonishing how a small part such as the Brain Barrier System is recognized as one of the most important systems which ensures the proper functioning and development of the human brain and body. The barrier systems of the brain also comprise the Blood-Brain Barrier which is a semi-permeable membrane that separates the extracellular fluid of CNS from the circulating blood. According to the studies, various functions of the nervous system, most importantly nerve impulse transmission, require the proper balance of ionic concentrations which contributes towards environmental stability (Saunders, Habgood, Møllgård, & Dziegielewska, 2016). Furthermore, it is depicted that the system is also involved in other functions associated with normal development such as transfer of amino acids, glucose, carboxylates, and vitamins. These functions occur in a different environment which is separated from the internal processes of the body.

If we go in depth in order to understand the structure of Brain Barrier system which contributes towards its function, we will find that it comprises of small dedicated tight connections present between the cells with the following interface: blood-brain barrier comprised endothelial cells, arachnoid membrane cells, epithelial cells of choroid plexus, and particular glial cells (Saunders et al., 2016). These interfaces form the basis of Brain Barrier systems. It is mainly associated with the inhibition of vesicular transport which is needed for the other vascular systems. These cells present on the interface, contain special structures such as Efflux Pumps and Transporters sometimes ATP binding Cassette transporter which contributes towards providing a significant feature of barrier functions by inhibiting the influx and efflux of various toxins and other drugs.

Various precautions have been recommended by the author to ensure the protection of the Blood-Brain Barrier which should be taken under consideration as BBB is the vulnerable part of the body whose survival mainly relies on its functionality.

References

Saunders, N. R., Habgood, M. D., Møllgård, K., & Dziegielewska, K. M. (2016). The biological significance of brain barrier mechanisms: Help or hindrance in drug delivery to the central nervous system? *F1000Research*, *5*. https://doi.org/10.12688/f1000research.7378.1