Point-of-Care Device for Vitamin D3

Problem Statement: Vitamin D deficiency is mild to moderate or severe deficiency. In case of severe deficiency, various symptoms may be observed, including bone and muscle pain, muscle weakness, hip pain, fractures, difficulty walking, climbing stairs, and getting out of a chair. The early detection of Vitamin D3 levels aid in the prevention of severe deficiency. Epidemiologic studies allow the identification of risk factors for vitamin D deficiency such as ageing, being overweight, dark skin pigmentation, wearing covering clothes, or having a low level of outdoor activity. Vitamin D deficiency prevails in epidemic proportions all over the Indian subcontinent, with a prevalence of 70 –100% in the general Indian population. However, commercially available tests are costly. Lateral flow-based methods are simple and quick tests to determine the presence and amount of a substance in the sample. The researchers have designed a diagnostic device that uses the paper shunt technology in lateral flow assay based testing and addressed the problem of making Vitamin D3 testing in India affordable and accessible.

Uniqueness of the Solution: A shunt is essentially a flexible tube, also popularly called a catheter. Such a shunt or a catheter has an inflow, a valve mechanism and an outflow to regulate the flow of the fluid. For instance, in treating hydrocephalus, a shunt is placed into the area of the brain where cerebrospinal fluid is produced. In this case, Paper shunt technology is used to make the lateral flow assay a more affordable point of care test for Vitamin D3 by minimising the use of antibodies in the assay.

Current Status of Technology: The prototype development stage is complete. The researchers have tested this product with a standard solution.

Societal Impact: The proposed device for detecting Vitamin D3 tries to make the testing affordable for everyone compared to other available devices for the same. Hence, the device can be used in rural areas or any place and low-income groups.

Patent(s): Filed

Relevant Industries: Healthcare, Medical Devices.

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