CGM: An overview of its development and clinical application

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Continuous Glucose Monitoring System(CGMS) is currently a hot topic in diabetes communities all around the world. Recent improvements in accuracy, usability, and accessibility of CGMS has made this system more effective in diabetic control. Especially, accuracy of CGMS has now reached to a point where automated control of insulin pump by CGM become acceptable. However, most of current user consider CGMS should do better. Survey reports in literature unanimously point out high cost, insufficient accuracy in hypoglycemic condition.

In this talk, glucose monitoring principles of CGMS is reviewed to elucidate how a CGM's glucose sensor in subcutaneous layer begins to replace a finger-prick test for glucose in capillary blood. Even though glucose levels in interstitial fluid(ISF) is highly correlated with those in capillary blood, ISF measurements are not always clinically relevant representatives for blood glucose levels. There are various physiological factors that alter a relationship between glucose levels in ISF and those in capillary blood. Following issues will be discussed;

- ✓ What are fundamental factors that defines the relationship of glucose levels in ISF and capillary blood?
- ✓ How have CGM communities found a way to successfully present one's blood glucose level to the user by measuring their ISF glucose level?

Meanwhile, in the CGM industry, the competition is getting tougher. New players are almost ready to introduce their CGM products in the market and the current player are also about to present the next version of their CGM products. Pressure for lowering price and, at the same time, increasing demand for enhancing accuracy make those players work harder to improve their technology. Especially, a better sensor is a key to achieve this goal. This talk will cover three main technologies that have been developed to detect glucose for clinical application. Each sensor technology has its own impact on performance, price, and potential complications when it is applied in a CGM sensor. Fundamental advantages and inherent limitations will be discussed in order to deepen the understanding of CGM products both in current and future market.

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