Early Detection of Pancreatic Cancer Using a Low-Cost & Non-Invasive Strip-Based Test Aided with a Smart Web-Application Utilizing Retrospective Data for Risk Assessment.

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With just 7% survival rates, Pancreatic Cancer continues to be one of the most lethal cancers in the world. In this cancer, significant upregulation of the polyamine called spermine, in the patient's saliva, is observed and can be attested as a potential biomarker. Our aim was to design a low- cost, strip-based assay scrutinizing spermine as a biomarker- for the early detection of Pancreatic cancer through saliva. The strip consists of 40nm carboxyl gold to show a color band at the control line when the target spermine present in the saliva binds with the anti-spermine gold-conjugated antibody & is detected by the secondary antibody. This test is also aided with a smart web-application that analyses a person's demographic, dietary & medical data to predict the associative cumulative risk for the incidence of Pancreatic Cancer. A cohort study was conducted to validate this strip which included subjects who were freshly diagnosed with various stages of PC as well as healthy controls from three local hospitals. The strip was tested against their saliva samples; The final batch of strips portrayed an accuracy of 81% for Pancreatic Cancer patients & 83.33% for controls. The main advantage of this new type of detection scheme is that it is totally non-invasive whereas all the other previous methods were majorly either minimally or highly invasive procedures. The cost per strip is just $0.5 which is nearly 1500 times cheaper than a general MRI scan or 95 times cheaper than the gold standard CA19-9 ELISA Blood Test. This test can easily be conducted by people at home regularly so that the early onset of this cancer could be detected efficiently.

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