INVESTIGATING THE USE OF A URINARY METABOLITE PANEL AS A SCREENING TEST FOR DIAGNOSIS OF HEPATOCELLULAR CARCINOMA IN A REMOTE ABORIGINAL SETTING

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Introduction:

Hepatocellular carcinoma (HCC) is now the second commonest global cause of cancer death. Aboriginal people in the Northern Territory (NT) have a six times higher incidence of HCC compared to non-Indigenous Australians, with the commonest cause in this setting being chronic hepatitis B infection (CHB). Aboriginal Australians diagnosed with HCC in the NT have a median survival of 64 days, with <15% of cases diagnosed via screening. If diagnosed early by screening (with 6 monthly ultrasound and alpha fetoprotein), this cancer is curable, if diagnosed late, it is universally fatal. The logistics of screening in the remote NT are complex and innovative methodologies are urgently needed.

Methods:

We undertook a pilot study looking at the feasibility of using urinary metabolomics to screen for HCC in remote dwelling Indigenous Australians in the NT setting. Following informed consent, 54 Aboriginal Australians, including 32 with CHB, 5 with CHB and cirrhosis, 7 with HCC and 10 normal controls, completed a dietary questionnaire and provided a urine sample. Urine samples were transported to Darwin within 12 hours, where they were aliquoted and stored at -80^{o}C. Samples underwent metabolomic analysis using reversed phase liquid chromatography-mass spectrometry (LCMS) at Imperial College London.

Results:

Principal component analysis showed the points representing HCC samples are observably separated from the other groups which suggests there is compositional difference in the samples between the groups. This was supported by a partial least squares-discriminant analysis which showed the summary of the predictive ability of the models to distinguish between urine from patients with HCC and those without have Q^2Y values of 0.52 (controls) and 0.62 (CHB) suggesting the models are predictive.

Conclusion:

Preliminary results from a pilot study looking at the use of urinary metabolomics to screen for HCC in a remote Indigenous setting suggest it warrants further investigation into feasibility and diagnostic accuracy.