NOTION: iN-home sampling Of cyTokines in ImmunOtherapy patieNts

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Introduction

Immune checkpoint inhibitors (CPIs) have shown remarkable success in targeting a range of hard-to-treat cancers. However, immune related adverse events (irAEs) are commonly seen with CPIs. On combination CPIs up to 90% of patients will experience an irAE of any grade related to their treatment1 and 20% will need to discontinue treatment as a result2.

There is currently no way to determine whether a patient is likely to have an irAE on CPI therapy. However, emerging evidence suggests that changes in cytokine levels may differentiate patients who are likely to develop irAEs from those who do not, and the severity of those irAEs3. Furthermore, the COVID-19 global pandemic has highlighted that remote healthcare is essential for the future of patient treatment. Therefore, the NOTION study was developed to evaluate the feasibility of regular dried blood spot sampling and whether cytokine concentrations obtained through this method correlate with irAEs.

Methods

A broad panel of cytokines, identified from the literature, are currently under validation using ELISA and the Neoteryx Mitra device (see figure 2).

The Mitra device was evaluated alongside other blood collection devices with patient and public involvement. The Mitra was identified as the most user-friendly device for remote blood collection. Patients have provided input on the study design through patient focus groups and were instrumental in developing the in-home sampling process.

Results

The NOTION study is a technology trial developed by the digital Experimental Cancer Medicine Team, CRUK Manchester Institute and The Christie NHS Foundation Trust. The objective is to evaluate longitudinal in-home sampling of cytokines in renal, melanoma and lung patients on combination CPI therapy.

Participants will take up to 48 dried blood spot samples at home over a 16-week period (see figure 1) and post the samples weekly to the CRUK MI laboratories for analysis. Clinical data will be collected at their standard clinic visits alongside intravenous blood samples which will be compared to dried blood spot samples. Data will be evaluated retrospectively to assess correlations between changes in cytokine levels and onset and severity of irAEs.

Conclusions

• Remote sampling of cytokines could provide the ability to closely monitor patients on combination immunotherapy, potentially detecting irAEs earlier and thus allowing for faster interventions.

• Having a process in place that can monitor cytokine changes has the potential to mitigate the impact of irAEs on patients health and allow them to stay on treatment for longer.

• The recent COVID-19 pandemic has highlighted the need for increased remote monitoring to assess patient health from their home, especially in vulnerable populations.

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References