

Capillary sampling is suitable for high-throughput remote therapeutic drug monitoring for biologics

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Background

Home capillary sampling via finger pricks presents a way to facilitate Therapeutic Drug Monitoring (TDM) for biologics, but its feasibility for large scale implementation remains unexplored. Building on our experience of integrating capillary sampling in a COVID-19 study involving both rheumatic patients and healthy controls, we aimed to evaluate the efficacy of capillary sampling by individuals in an at-home setting, and assess the patient perspective towards this method.

Methods

Data were collected from 3080 Dutch rheumatic patients and 1102 healthy controls. Serum samples were collected up to eight times during follow-up by venepuncture or finger prick for analyses of SARS-CoV-2 antibody titres. Digital questionnaires were used to evaluate participants' experience with the finger prick. The finger prick was considered successful when at least 10 μ L of serum could be recovered from the collection device. No returned sample combined with indication of inability to collect the required amount of serum was considered an unsuccessful finger prick execution.

Results

During the conduct of the study, 2135 (69%) patients and 899 (82%) controls executed at least one finger prick. The first finger prick was successfully performed by 92% (CI: 90-93) of rheumatic patients, 94% (CI: 92-95) of controls, 93% (CI: 92-94) of all participants under 70 years, and 89% (CI: 86-92) of all participants above 70 years. Sex did not impact these success rates. Repeated failure occurred in 11 (0.8%) of 1439 patients and 4 (0.6%) of 712 controls. The most common reasons for perceived failure of the finger prick were related to insufficient blood yield when applying the finger prick. Both patients and controls were less willing to perform a finger prick for individual healthcare compared to scientific research, mostly due to lower confidence in the execution and laboratory measurements.

Conclusions

We demonstrated that most participants, including elderly and patients with underlying rheumatic diseases, were able to successfully draw the required amount of blood for serological analyses. This shows that finger prick testing is suitable for high-throughput remote patient monitoring, and can therefore facilitate large-scale TDM studies and enhance TDM implementation in clinical practice.

Key Words

Remote sampling
Finger prick