Design and Implementation of the Decentralized Immunological Substudy for the COVER-MS (COVID-19 VaccinE Response in MS) Project

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Background

In 2021, as COVID-19 vaccines were gaining regulatory approval and becoming available to the public, the iConquerMS people-powered research network launched a survey-based study (COVID-19 VaccinE Response in MS, or COVER-MS) to help answer pressing questions about the effects of COVID-19 vaccines in people with MS (PwMS). The initial findings of this study were that the COVID-19 vaccine reactogenicity profiles were similar in PwMS compared with the general population, providing reassurance that these vaccines were safe to use for PwMS.

However, questions remained about the effectiveness of the different types of vaccines in PwMS, and the impact of exposure to DMTs with different mechanisms of action on vaccine effectiveness. To gain insights on these topics, a substudy was launched in 2022 to collect longitudinal blood samples from vaccinated PwMS and measure Spike and nucleocapsid antibodies and T-cell responses to the COVID-19 virus and vaccines. A decentralized study design was chosen which would enable nationwide participation of iConquerMS members by leveraging an existing distributed clinical network.

Objectives

The objective of the design and implementation of COVER-MS was to establish a decentralized, repeatable process for collecting blood samples from PwMS across the US for analysis at a central laboratory. Emphasis was placed on designing an inclusive, patient-centered study that could successfully enroll and collect blood samples and data from a representative national population.

Methods

Stakeholder engagement: The substudy was designed by a team which included PwMS, scientists, and representatives of Accelerated Cure Project (ACP), Quest Diagnostics, and the National Multiple Sclerosis Society (NMSS). Oversight was provided by the COVER-MS multi-stakeholder Steering Committee.

Recruitment and consent: The COVER-MS substudy protocol, informed consent form, and materials were approved by WCG IRB. Participants were recruited from a cohort of iConquerMS members who had already participated in COVER-MS surveys and appeared to be eligible based on MS diagnosis, US residence, and COVID-19 vaccination experience. Invitations were sent in batches to control enrollment rates, and consent was accomplished electronically through the iConquerMS portal.

Sample collection: Sample collection kits were shipped to consented participants along with instructions for scheduling their sample collection appointment. The kit included supplies such as tubes, cold pack and shipping materials. A tote bag was also included to help with transporting the kit, which weighed around 8 pounds and measured approximately 1 foot x 1 foot x 1.5 feet.

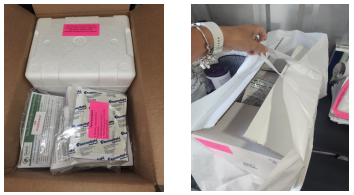

Figure 1: COVER-MS sample collection kit and tote bag

Participants visited the Quest Diagnostics web site to schedule an appointment with their local Patient Service Center (PSC). Appointments were required to be scheduled for Monday through Wednesday from 9-11 am to accommodate FedEx pickup schedules and enable samples to be processed on a weekday. Participants who could not travel to a local PSC due to factors such as distance, disability, or lack of transportation were offered the option of having a Quest mobile phlebotomy provider (Exam One) collect their samples. Once appointments were made, a Quest representative contacted the PSC/mobile phlebotomist to explain the study and the specific collection requirements.

Following collection, the Quest PSC staff or phlebotomist shipped the samples via FedEx to a Quest esoteric lab.

Data collection: After each sample collection, participants were asked to visit the iConquerMS portal to complete a survey. Topics covered included COVID-19 vaccinations received, recent MS relapses and therapies, recent COVID-19 infections and any treatments received for them, and recent medications received including steroids and Evusheld.

Participant support and appreciation: Participants could contact a Quest representative directly in case of questions or issues. They received gift cards for each collection, and were provided with their individual clinically relevant antibody results via the COVER-MS study portal.

Results

A total of 953 COVER-MS participants were contacted about the substudy, and 236 enrolled, representing 41 states and the District of Columbia. 228 participants were able to schedule an appointment and provide a blood sample at a Quest PSC or through the Exam One mobile phlebotomy service.

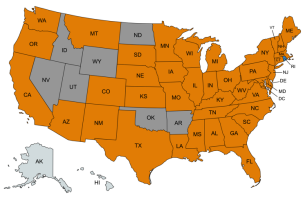

Figure 2: National coverage of the COVER-MS substudy

Approximately 6 months following their first sample collection, participants were invited to schedule a second collection. A third collection was also offered approximately 6 months following the second. 206 participants had two collections, and 189 had three, resulting in a 83% retention rate.

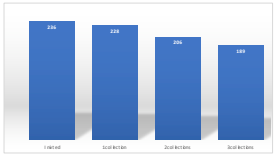

Figure 3: COVER-MS substudy visit totals

36 samples required recollection due to problems such as underfilled or broken tubes or shipping delays. Participants whose samples needed to be collected were offered the option of a mobile phlebotomy visit if preferred.

In the post-collection survey, participants were invited to share their feedback about the study and the sample collection process. More than half of those who commented expressed appreciation for the study objectives and design and/or complimented the staff with whom they had interacted. Some participants noted that the Quest PSC personnel appeared unfamiliar with the study instructions, which required performing steps that were outside the normal clinical testing processes carried out by the PSC. A few people also commented that they found some of the participant study activities (such as making an appointment or transporting the kit) difficult or unclear.

Conclusions

This substudy demonstrated the feasibility of collecting and shipping research blood samples from PwMS in a decentralized manner. The use of a nationwide network of patient service centers and a mobile phlebotomy service enabled the inclusion of PwMS for whom location, transportation challenges, or lack of mobility would prevent enrollment in a traditional clinic-based study.

Positive feedback from participants and a high retention rate across visits indicate that the study was feasible for PwMS, reflecting the value of the patient-centered design processes employed. Future studies based on this sample collection model might benefit from identifying additional ways to streamline or clarify study activities for both participants and collection personnel.

We recommend this model for future biomarker studies in which participant diversity, convenience of participation, and economical sample collection are desired.

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Disclosures

M. Racke and J. Larsen are both employees of Quest Diagnostics.

For more information

Please contact Hollie Schmidt (hollie@acceleratedcure.org) for more information.