12/12/2024, 19:19   Paper: Mympnvoice – a Novel Smartphone App for Monitoring Patient Reported Outcomes and Biometric Data in Patients with Myeloproli…

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4557 Mympnvoice – a Novel Smartphone App for Monitoring Patient Reported Outcomes and Biometric Data in Patients with Myeloproliferative Neoplasms

Program: Oral and Poster Abstracts
Session: 634. Myeloproliferative Syndromes: Clinical and Epidemiological: Poster III
Hematology Disease Topics & Pathways:
Research, Clinical Research, Chronic Myeloid Malignancies, Patient-reported outcomes, Diseases, Real-world evidence, Myeloid Malignancies, Emerging technologies, Technology and Procedures

Monday, December 9, 2024, 6:00 PM-8:00 PM

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Aims:

To improve monitoring and understanding of patient reported outcomes (PRO) and biometric data in myeloproliferative neoplasm (MPN) patients through innovative development of a smartphone app linked to a wearable device.

Methods:

The MyMPNVoice app and associated study (IRAS 332286) launched in April 2024. The app allows patients to record MPN-10 total symptom score (TSS) and other PRO including QoL score EQ-5D-5L. Biometric data were collected through a linked wearable device (Withings Smartwatch). Participants enrolled by self-referral through an online platform. Eligibility criteria include age over 18, access to a smartphone and confirmed diagnosis of MPN.

A Linear Mixed Model was used to account for repeated measures, with age and sex as covariates. Age/sex were excluded from treatment modelling due to the small cohort size.

Results:

At data cut-off (18th July 2024), 139 patients were recruited with median follow-up of 49 days. Median age was 55 years (range 27-80), 63% were female. Patients had a mean daily completion rate of 66% across EQ-5D-5L and MPN-10 PRO measures (range 0-95%). 4 patients discontinued the study. A total of 99110 PRO, 74439 sleep and 99110 activity data points were collected. 58 (42%) had essential thrombocythaemia (ET), 48 (35%) polycythaemia vera (PV), 19 (14%) myelofibrosis (MF) and 14 MPN not otherwise specified (NOS).

Mean (Estimated Marginal Means, EMM) MPN-10 total symptom score (TSS) across the patient cohort was 13.7 (0-90), in ET 17.0 (0-74), PV 12.8 (0-90), MF 11.4 (0-62, ET vs PV, MF p<0.001). Mean (EMM) EQ-5D-5L score across the patient cohort was 0.805 (-0.436-1.000), in ET 0.792 (-0.436-1.000), PV 0.823 (-0.247-1.000), MF 0.800 (0.300-1.000, ET vs PV p<0.001).

In ET patients MPN-10 score was 20.3 in patients treated with hydroxycarbamide (HC, n=14), 13.2 with pegylated interferon (IFN, n=15) and 11.5 on active surveillance (AS, n=25) (HC vs IFN, AS p<0.001). In PV patients MPN-10 score was 13.7 in patients treated with HC (n=8), 20.2 in IFN (n=12), 12.1 on ruxolitinib (RUX, n=3) and 13.4 on AS (n=21) (IFN vs HC, RUX, AS p<0.001). In MF patients MPN-10 was 12.9 in patients treated with HC (n=2), 7.1 in IFN (n=1), 6.9 on momelotinib (MMB, n=3), 13.1 on RUX (n=5) and 13.9 on AS (n=8) (MMB vs AS, RUX p<0.001).

Biometric data in ET patients saw significant differences between treatment groups regarding activity levels (distance, elevation, steps), with HC having the lowest and AS the highest overall levels. In PV patients, IFN treatment linked to significantly lower intense and moderate activity durations than other groups. Both steps and distance were significantly higher in AS, and HC compared with IFN and RUX. Sleep metrics saw RUX exhibit highest deep and total sleep durations. Biometric data in MF patients saw AS link to significantly higher activity levels than both RUX (calories, distance, elevation, intense and soft activity) and MMB (distance, elevation, soft activity, steps). Patients treated with MMB recorded lowest light and total sleep levels, lowest wakeup counts and longest durations to sleep.

In ET increasing TSS correlated with decreasing active time; calorie expenditure; distance; elevation; active heart rate (HR); steps and sleep duration, amongst other metrics. In contrast positive correlation was observed between TSS and duration in HR Zone 0; breathing disturbances; wakeup count and duration. Similarly in PV a negative correlation was identified between TSS and active time; distance; elevation; average and maximum HR; intense and moderate activity; and sleep duration, amongst others. Significant positive correlation was observed between TSS and duration in HR Zone 0; soft activity; breathing

amongst others. Significant positive correlation was observed between TSS and duration in HR Zone 3; soft activity; breathing disturbance severity and sleep HR. In MF, a negative correlation was seen between TSS and active time; steps; total calories and sleep duration amongst others. Positive correlation was observed between TSS and active HR; deep sleep duration; sleep HR; wakeup count and duration.
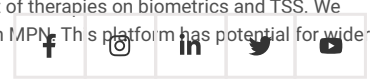
Discussion

We present novel initial data from an innovative MPN patient smartphone app linked to biometrics. We demonstrate significant trends in symptom burden across MPN subtype as well as the impact of therapies on biometrics and TSS. We describe, for the first time, correlation between TSS and various biometric data in MPN. This platform has potential for wider application in MPN and other disease areas. Updated results will be presented.

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