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## 2339 Feasibility of Advanced Remote Health Monitoring in Waldenström Macroglobulinemia: Integrating Wearable Technology and Digital Quality of Life Tracking

Program: Oral and Poster Abstracts

Session: 906. Outcomes Research: Lymphoid Malignancies Excluding Plasma Cell Disorders: Poster I

Hematology Disease Topics & Pathways:

Research, Artificial Intelligence (AI), Adult, Translational Research, Clinical Practice (Health Services and Quality), Lymphomas, Non-Hodgkin lymphoma, B Cell lymphoma, Diseases, Indolent lymphoma, Lymphoid Malignancies, Emerging technologies, Technology and Procedures, Study Population, Human

Saturday, December 7, 2024, 5:30 PM-7:30 PM

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### Background

A rare and indolent B-cell lymphoma, Waldenström macroglobulinemia (WM) is known to exhibit a vast range of clinical manifestations that can in turn severely impact quality of life (QoL). While recent years have seen a promising emergence of novel targeted therapies, there is a lack of existing patient-reported outcomes (PROs) with the necessary specificity to accurately assess QoL in WM and across treatment pathways. As such, tailored assessment tools that enable monitoring of WM's unique symptoms, daily patient experiences, and treatment impacts are critical.

### Aims

To advance the understanding of WM patient experiences, monitor treatment impacts, and identify WM-specific metrics through the remote tracking of wearable-linked physiological metrics and digital QoL markers, with an exploration of patient subgroup variations.

### Methods

75 patients with WM consented to data capture and analysis as part of a comprehensive digital ecosystem (274-day snapshot: Nov 2023-Jul 2024), utilising an FDA-cleared smartwatch for continuous and automated recording of activity, sleep, and heart rate (HR). This was integrated with daily mobile app-captured ePRO data (EQ-5D (5L and Health State) and symptom severity (1-5)), and analysed at both cohort and subgroup levels (age, sex, treatment) using Pearson Correlation and Linear Mixed Models (LMM). Treatment status was reported by patients at enrolment and updated via the app and an additional e-survey.

### Results

The median±SD (range) age was 67±10 (43-88) years and 51% were female; 16% (12/75) receiving BTKi, 5% chemotherapy, 3% clinical trial treatment, 7% 'other' WM medications, 5% a combination of these treatments (multiple), and 64% with no recorded medication. ePROs observed a completion rate of 49%, while synced wearables (64/75) recorded 68% and 79% completion for sleep and activity, respectively. Across the pooled patient cohort, a median EQ-5D-5L of 0.806±0.190 and Health State of 78±19 were reported, with 'Fatigue' (2.0/5) presenting the most severely scored symptom. Biometric capture identified median steps of 3,244±3,635, active HR of 70±25, sleep duration of 07:25:00±01:55:40, and sleep HR of 61±11.

Statistically significant correlations were identified between wearable biometrics and QoL. Decreasing symptom severities and increasing EQ-5D correlated with increasing activity levels, longer sleep duration, and fewer wakeups. Positive correlations ( $p<0.001$ ) were observed between age and active HR; intense activity; breathing disturbances; total and deep sleep; duration to sleep; wakeup counts and duration; and symptom severity scores including breathlessness, dizziness, fatigue, and night sweats. Negative correlations were seen between age and active distance, elevation, steps, moderate and soft activity, sleep HR, light sleep duration, and EQ-5D.

EQ-5D-5L (0.770 vs. 0.805,  $p<0.001$ ) and Health State (71 vs. 77,  $p<0.01$ ) were significantly lower in females than males, in addition to activity measures such as distance (2,997 vs. 3,668,  $p<0.001$ ) and steps (4,207 vs. 4,659,  $p<0.001$ ). The symptom 'numbness/tingling' was significantly lower in female than male patients (1.3 vs. 1.7,  $p<0.001$ ). Regarding sleep metrics, females recorded 40-minute longer deep sleep durations ( $p<0.001$ ) overall.

LMM identified statistically significantly lower EQ-5D-5L in patients who recorded no treatments (0.797) compared to BTKi (0.852,  $p=0.006$ ) and 'other' WM medications (0.870,  $p=0.024$ ). Activity levels were significantly higher in the BTKi group compared to 'other' and 'no treatment', including distance (4,873 vs. 1,983 vs. 3,414,  $p<0.001$ ), elevation (77 vs. 18 vs. 44,  $p<0.001$ ), and steps (6,601 vs. 4,532 vs. 2,695,  $p<0.001$ ). Patients receiving BTKi saw 30 and 36 minutes less deep and total sleep, respectively, compared to those with no recorded treatment ( $p<0.001$ ).

### Conclusion

Our data identify initial differences by age, sex, and treatment groups in WM, and demonstrate the feasibility of remotely monitoring key health and QoL metrics. Despite a relatively small cohort size across groups attributable to the rarity of WM, work is ongoing to increase patient numbers and generate more translatable insights. This baseline of key wearable biometrics and ePROs, captured within a supported digital ecosystem, seeks to advance the understanding of patient experiences, distinct subgroups, and real-time effects of treatments on outcomes.

**Disclosures:** **Summers:** *Sanius Health:* Current Employment. **Agrippa:** *Sanius:* Current Employment; *Pfizer Ltd:* Consultancy. **Yusuf:** *Sanius:* Current Employment. **D'Sa:** *BeiGene:* Membership on an entity's Board of Directors or advisory committees, Research Funding, Speakers Bureau; *Collectar:* Membership on an entity's Board of Directors or advisory committees; *Sanius Health Ltd:* Consultancy



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