ASSOCIATION OF QUALITY OF LIFE WITH PERFORMANCE STATUS, CIRCADIAN RHYTHM, AND ACTIVITY LEVEL OF LUNG CANCER PATIENTS USING WEARABLE DEVICES AS AMBULATORY MONITORING

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INTRODUCTION: Lung cancer survivorship has two critical attributes, survival time or quantity and quality of life (QoL)(1). After decades of efforts focusing on reducing lung cancer incidence and mortality, we are now challenged by the lack of understanding of the health conditions and QoL among people who survived lung cancer(2). We here report on the first integration of clinical data, wearable devices, and QoL questionnaires, in order to determine the factors that predict poor health status, in order to design personalized interventions that will improve the patient´s QoL, based on clinical and real-world data (3-5)..

METHODS: Patients diagnosed and treated at the Medical Oncology Department at Puerta de Hierro-Majadahonda University Hospital were included. Eligible patients were aged >18 years old, were diagnosed with non-small cell lung cancer (all stages), and had an ECOG 0-1. Artificial Intelligence (AI) and Knowledge Discovery (KD) techniques were used to integrate heterogeneous datasets and synthesize complex relationships within these large data sets. A watch-like wearable device ("Kronowise 3.0", Kronohealth SL, Spain) was placed on the patient´s wrist for a whole week, registering 24h a day, temperature, physical activity, and light exposure. Written informed consent was obtained from all patients prior to the initiation of the study. The EORTC Core Quality of Life questionnaire (EORTC QLQ-C30), designed to measure cancer patients' physical, psychological and social functions, was completed by all patients.
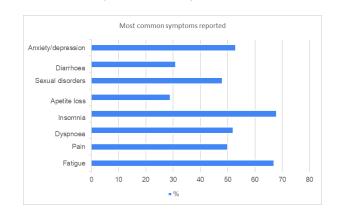
RESULTS AND DISCUSSION: A total of 140 patients were included in the study; 32 were diagnosed with localized disease (IA-IIIB), and 98 with advanced stage IIIC/IV receiving different treatments (radiotherapy, chemotherapy, immunotherapy, chemotherapy plus immunotherapy, tyrosine kinase inhibitors) (Table 1). Results from QoL questionnaires showed that pain, dyspnea, and insomnia were the most common symptoms reported by lung cancer patients. Additionally, 67% of patients reported fatigue and 53% suffered from anxiety and depression. These results match the objective monitoring obtained from the wearable device, which showed sleeping disorders in 68% and lack of physical activity in 54% of patients, compared to healthy population parameters.

CONCLUSIONS: Preliminary results suggest that wearable devices and QoL questionnaires are useful in detecting sleep disorders, inactivity, and other factors that could influence the QoL during and after lung cancer treatment. Design and validation of the effect of multidisciplinary interventions based on clinical and real-world data from the patients will ensure a personalized follow-up with a better assessment of their needs and eventually improve their quality of life, wellbeing, and outcome.

STAGE	TREATMENT	N (130)
LOCALIZED N=32	CHT	8
	IO	4
	CHT/IO	2
	Follow-up	18
ADVANCED N=98	RT	2
	CHT	25
	IO	35
	CHT/IO	10
	TKI	18
	Follow-up	8

CHT: chemotherapy; IO: immunotherapy; RT: radiotherapy; TKI: tyrosine-kinase inhibitors.

Table 1. Number of patients classified by treatment

Most common symptoms reported

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