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ASSESSMENT OF RESIDUAL RADIOACTIVITY BY A COMPREHENSIVE WIRELESS, WEARABLE DEVICE IN PATIENTS UNDERGOING RADIONUCLIDE THERAPY HOSPITALIZED IN RESTRICTED AREAS: COMPARISON WITH THE RESULTS OF A HOME DEVICE

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BACKGROUND-AIM

This study compared the measurements of residual radioactivity obtained by a wireless wearable device (WD) with those registered by a permanent environmental home device (HD) in patients undergoing radionuclide therapy with I-131 (RAI) and protected-hospitalization.

METHODS

Twenty consecutive patients undergoing RAI, hospitalized in restricted, controlled areas were enrolled. The patients received a comprehensive monitoring of vital/non-vital parameters. We obtained 45580 ± 13 measurements from the WD, detecting the residual radioactivity for each patient during about 56 hours of hospitalization picking up data for 53 times in an hour. The samples collected during daily activities were averaged every two hours and results correlated with those from HD. Bland-Altman analysis was also used to evaluate the agreement between the two techniques.

RESULTS

A significant relationship between WD and HD was observed; $r=0,96$, $p<0,0001$. Bland-Altman analysis recognized the agreement between measurements by WD and HD. The mean value at the end of first day of hospitalization was 80,81 microSv/h and 60,77 microSv/h; $p=ns$ for WD and HD, respectively, whereas those at the end of the second day were 47,08 and 24,96; $p=ns$. At LGM a similar trend in performance across time was found with the two techniques.

CONCLUSION

This study demonstrates a good agreement between the residual radioactivity measures estimated by WD and HD modalities, being them interchangeable. This approach would provide both optimization of medical staff exposure and more safe patient discharge.