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**The impact of the temporal sequence of cranial radiotherapy and platin-based chemotherapy on hearing impairment in paediatric and adolescent head cancer patients: A report from the PanCareLIFE Consortium**

The impact of the temporal sequence by which cranial radiotherapy (CRT) and platin-based chemotherapy (PCth) are administered on sensorineural hearing loss (SNHL) in paediatric and adolescent central nervous system (CNS) and head-and-neck (HN) cancer patients has not yet been studied in detail. We examined the ototoxic effects of sequentially applied CRT and PCth. This study included children and adolescents with CNS and HN tumours who participated in the multi-country PanCareLIFE (PCL) consortium. Audiological outcomes were compared between patients who received CRT prior to PCth and those who received it afterwards. The incidence, degree and post-treatment progression of SNHL, defined as Muenster Classification grade  $\geq$  MS2b, were evaluated in 141 patients. 119 patients were included in a time-to-onset analysis. Eighty-eight patients received CRT prior to PCth (group 1) and 53 patients received PCth before CRT (group 2). Over a median follow-up time of 1.6 years, 72.7% of patients in group 1 experienced SNHL  $\geq$  MS2b compared to 33.9% in group 2 ( $P < .01$ ). A time-to-onset analysis was performed for 74 patients from group 1 and 45 patients from group 2. Median time to hearing loss (HL)  $\geq$  MS2b was 1.2 years in group 1 and 4.4 years in group 2 ( $P < .01$ ). Thus, audiological outcomes were better for patients who received CRT after PCth than for those who received it before. This finding should be further evaluated and considered in clinical practice so as to minimise hearing loss in children and adolescents with CNS and HN tumours.