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The effects of changes in serum sodium concentration on prognosis in non-small cell lung cancer

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Objectives: Hyponatremia is a negative prognostic factor in several malignancies. Non-small-cell lung cancer (NSCLC) is a poor-prognosis malignancy; and the incidence of hyponatremia in NSCLC varies from 1%-50%. Little has been studied about the impact of hyponatremia on the prognosis of NSCLC. We aimed to investigate the relationship between sodium and prognosis of NSCLC especially regarding the change of sodium level during treatment

Methods: Among 2,225 patients diagnosed as NSCLC between 2010 and 2017, 1,925 patients with available full medical records under treatment were enrolled. Laboratory data were collected twice at diagnosis and 3 months after (when the first treatment effect assessed).

Results: The mean age was 70.57 years, 65.5% was male; 1,310 patients were in stage 3/4. Hyponatremia was defined below Na <135mEq/L and 218 patients (11.3%) were in hyponatremia at diagnosis. Of 1707 patients, 229(13.4%) had newly developed hyponatremia for 3 months. Patients were classified according to initial and succeeding sodium levels (mEq/L) at 3 months as follows: well-maintained, both ≥ 135 (n=1550, 80.52%); improved, from <135 to ≥ 135 (n=119, 6.18%); declined, from ≥ 135 to <135(n=157, 8.16%); and poorly maintained, both <135(n=99, 5.14%).

All three groups were associated with increased mortality compared to the Well-maintained group before adjustment. (hazard ratio (HR) [confidence interval (CI)]: Declined 2.74 [2.09-3.59, p<0.001]; improved 2.92[2.18-3.93, p<0.001]; poorly maintained 3.88 [2.81-5.35, p<0.001]

The association was diminished between Well-maintained vs. Improved after adjustment with demographics, clinical and laboratory findings (p=0.545). On the other hand, survival was significantly worse in the Declined and Poorly-maintained group even after adjustment (2.12[1.54-2.91, p<0.001] and 1.84[1.21-2.80, p=0.004], respectively).

Conclusions: Hyponatremia occurring in the course of treatment, rather than the value of diagnosis was significantly associated with worse survival of NSCLC. This suggests that early recognition and proper treatment of sodium abnormalities in patients under treatment for NSCLC could be beneficial for survival.