Background: Hypothyroidism was a known and common side effect from multikinase inhibitors notably in sunitinib, pazopanib and sorafenib. The goal of this study was to explore risk factors in developing hypothyroid and whether the occurrence of this endocrine adverse event (AE) leading to better survival outcomes.

Method: Seventy-one renal cell carcinoma (RCC) patients and 136 hepatocellular carcinoma (HCC) patients were retrospectively analyzed. Data relating to the treatment course and development of hypothyroid were collected, extracted and presented in separate cohort.

Results: The incidence of hypothyroidism was 47.8% in RCC patients treated with either sunitinib or pazopanib. For HCC patients whom received sorafenib, the incidence of hypothyroidism was 31.8%. We found no factor significantly associated with hypothyroidism in RCC patients. HCC patients whom had duration of treatment of less than 3 months tend to develop hypothyroidism. There was no significant association between the development of hypothyroid and PFS or OS in RCC patients. In HCC group, euthyroid patients had statistically significant longer mPFS [7.6 vs. 2.2 months; HR = 6.38; 95%CI 1.87-21.8; p = 0.003] and mOS (16.9 vs. 5.2 months; HR = 22.96 ; 95%CI 4.45-118; p = 0.<001) than the hypothyroid group.

Conclusions: Hypothyroid is the most common endocrine AE of multikinase inhibitors. There are no significant clinical factors associated with the development of hypothyroid. This AE might serve as a good predictive marker for multikinase inhibitors treatment in HCC patients and their survival outcomes. The larger cohort is needed to confirm this evidence.