



Metastasis of papillary thyroid cancer: does body mass index (BMI) is the key factor?

Yuning Sun[^], Shaoyan Liu

Department of Head & Neck Surgical Oncology, National Cancer Center/National Clinical Research Center for Cancer/Cancer Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing, China

Correspondence to: Shaoyan Liu, Department of Head & Neck Surgical Oncology, National Cancer Center/National Clinical Research Center for Cancer/Cancer Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100021, China. Email: shaoyanliu.bj@263.net.

Comment on: Kim JM. The clinical importance of overweight or obesity on tumor recurrence in papillary thyroid carcinoma. *Gland Surg* 2022;11:35-41.

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Overweight and obesity has been proved to be associated with the increased risk of papillary thyroid cancer (PTC). Compared with normal weight, overweight and obesity even shown nearly threefold to fivefold increased risks of large PTCs (1). In the background of increasing incidence of thyroid cancer internationally, the role of overweight, obesity and related metabolic syndrome cannot be ignored. However, whether overweight or obese thyroid cancer patients have worse prognosis or a higher risk of recurrence remains controversial, which was a common question among different kinds of cancers (2).

We read the recent article written by Kim entitled “*The clinical importance of overweight or obesity on tumor recurrence in papillary thyroid carcinoma*” (3) carefully. Kim demonstrated that overweight or obesity might be associated with poor prognosis of PTC but might not be associated with the tumor recurrences of PTC. We really thank the author for such valuable evidence and would like to make several comments on this study.

In this retrospective study, the author enrolled 403 patients with PTC and 42% of them with overweight or obesity. In the comparing of clinicopathological characteristics between the obese and non-obese patients, obese patients tend to have higher ratio of male (25% vs. 8.9%, $P<0.001$), fasting glucose level (110 ± 24 vs. 104 ± 26 mg/dL, $P=0.03$) and higher fasting total cholesterol level (200 ± 39 vs. 188 ± 37 mg/dL, $P=0.003$). Of note, author observed a higher ratio of multiple nodules at diagnosis in overweight

or obesity patients than normal weight (40% vs. 27%, $P=0.006$) but a similar ratio of extrathyroid extension (ETE) between each group ($P=0.3$).

This finding is in contrast to another study (4) which enrolled 1,216 patients whose result shown a higher ETE in obese patients but not in overweight or normal patients (32% vs. 21% vs. 24%, respectively, $P=0.03$). And a meta-analysis (5) which involved 26,196 participants carried out by Renehan *et al.* also described that elevated body mass index (BMI) was significantly associated with ETE and multifocality in overweight and obese patients and only obesity was significantly associated with increased tumor size. The same effect can also be seen in many studies (6,7). Therefore, the aggressiveness of PTC may associated with the increase of BMI, so it is necessary to divide overweight and obese patients in different groups. However, in this paper, the author combined overweight and obese patients in one group, which may cover up the significance.

In addition, the author did not define how long participants has been overweight or obese at the time of enrollment or whether weight changes in these patients during the follow-up and led to changes in their grouping. This is a key question if body weight is a preventable and modifiable factor of PTC.

Finally, in our opinion, Kim found a strong correlation between high BMI and the recurrence of PTC with univariate analysis but not with multivariate analysis. In fact, previously observational studies demonstrated obese

[^] ORCID: 0000-0002-5566-6227.

patients had an increased risk of developing a locoregional recurrence or persistence during the follow-up, which indicate that body weight may have a strong correlation with a key factor that cause the recurrence of PTC. It would be very interesting to further investigate the possible correlation between BMI and the recurrence of PTC.

In conclusion, this study carried out by Kim provided another possible key factor affecting the prognosis of PTC patients, and we make these comments only to recommend that the authors of similar such studies may take into account these additional points.

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