Reviewer's report

Title: Relationship between parathyroid glands and parathyroid hormone levels in hemodialysis patients with secondary hyperparathyroidism

Version: 1 Date: 3 November 2014

Reviewer: Klaus Olgaard

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BMC Nephrol Review:
The manuscript, “Relationship between parathyroid glands and parathyroid hormone levels in hemodialysis patients with secondary hyperparathyroidism” by Li Fang et al deals with a retrospective analysis of parathyroid tissue size (874 glands) and PTH levels in large cohort of 223 parathyroidectomized dialysis patients. They find in the study that in the subgroup of patients with PTH>1000 pg/ml, serum intact PTH correlated significantly with the parathyroid gland mass. It is concluded that “since PTH levels could easily be influenced by the pharmaceutical drug, the size of parathyroid gland might be used as a much more appropriate guide for the indication of surgical treatment comparing to PTH level”.

Comments:
1. The strengths of the paper is the very large number of parathyroid glands examined. The result are, however, only very sparsely described and not even in enough details to support the conclusion above. The patients were evaluated by ultrasonography and parathyroid scintigraphy, the results of these examinations are unfortunately not provided and the accuracy of the methods are not calculated. Therefore, the above conclusion is only valuable when the PTX has been performed and will as such not unfortunately not provide any meaning in the clinical evaluation. Please, discuss this part in details in the Discussion and please modify your conclusion appropriately.

2. Figure 2A presents a very nice correlation between weight and size of the parathyroid glands ex vivo. The in vivo data from ultrasonography and parathyroid scintigraphy need however also to be provided, the accuracy and sensitivity of the methods evaluated and the results discussed in relation to the measurements of size and volume and plasma PTH levels.

3. The pathology presented of the parathyroid glands is very sparsely provided, as it is just mentioned that all patients had the diagnosis of nodular parathyroid hyperplasia. The material demands for a more detailed description, on glands with a single large nodulus, glands with several noduli and glands with eosinofil noduli, correlation to PTH levels, Was necrosis present in some of the large glands? Did the find any mitotic activity? etc.

4. The exact criteria for total PTX should be presented. Secondary HPT by itself is not an indication for PTX in dialysis patients.
5. Why total PTX? and not partial PTX or autotransplantation?

6. What was the medical treatment that had been attempted before PTX and what was the relation to size and volume of the glands.

7. Approx 1/3 of the patients had PTH levels < 1000 pg/mL and the PTH levels in this large subgroup did not correlate with glandular size and volume, what was the indication for PTX in these patients, how many had large glandular size and volume. From Figure 3 it is evident that even small glands can be combined with very high PTH levels.

8. The clinical indication for PTX is usually obvious, when the PTH levels is of several thousands. The indication is, however, sometimes difficult to establish, when PTH is < 1000 pg/mL, but it is just in this situation that the results of the present investigation found that the volume parameters are not of any help. This needs to be stressed in the conclusion, and also in the Abstract. Both need to be modified.

9. I would suggest that the authors change the Title to “Relationship between parathyroid mass and parathyroid hormone ….” as they have it in the Running Title.

10. In “Selection of patients” the age of the patients included was > 18 years; In the Results the age range is from 16 to 70 years. Please clarify.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

'I declare that I have no competing interests'