Reviewer’s report

Title: Micro-morphologic changes around biophysically-stimulated titanium implants in ovariectomized rats

Version: 1 Date: 22 February 2007

Reviewer: Ulrich Plate

Reviewer’s report:

General

In this project micro-morphological changes in bone around titanium implants exposed to mechanical and electrical energy in osteoporotic rats were investigated. 15 ovariectomized female rats were taken to standardize induced osteoporosis. It was found that the biophysical stimulation remarkably enhances bone volume around titanium implants placed in osteoporotic rats. These results show that the method of low mechanical and/or electromagnetically energy should be used clinically as a therapeutic instrument coupled with an application schedule for oral/orthopaedic implants.

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Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

1. Bone metabolism
The reason why ovariectomized rats were used may be to get specimens with significant standardized bone metabolism for better calibrations? Or do you want to investigate the possibilities for implants directly for female osteoporotic patients? But if you only want to investigate micro-morphological changes in bone around titanium implants exposed to mechanical and electromagnetically energy independent of the sex of the rats you don’t need any impaired bone metabolism.

2. Biophysical stimulation
I miss defined declarations of the used values for mechanical vibration and for pulsed electromagnetic field stimulations; mainly the reason for the comparison of the three groups with only this applied values is incomprehensible.

3. Abbreviations
The list of the used abbreviations should be modified because many of the abbreviations describe standards, e.g. MV for Matrix Vesicle and not for mechanical vibration, CT for Computer Tomography and not for control group, TV for Television and not for test volume…

Some abbreviations are not declared, e.g. p8: BV/TV, with TV as the calibration factor, the test volume? Please declare detailed the differences and limits of trabecular thickness (mm), trabecular separations (mm) and trabecular number (1/mm)?

Sometimes it is difficult to read and/or interpret the manuscript with such undeclared abbreviations.

4. Statistics
In the text only the statistic values p without any advice to the significance, e.g. to schedules or tables are performed.

5. BAP (bone-specific alkaline phosphatase)
Please describe the method how you have measured the level of serum bone-specific alkaline phosphatase (BAP) in the blood. This is important because alkaline phosphatase (ALP) is present in serum in the form of several isoenzymes and the two major circulating ALP isoenzymes, bone and liver, are difficult to distinguish.

Or have you measured the BAP- and/or ALP-values directly before and then 4 weeks after the ovariectomy?

6. Table
Please indicate the p-values in the tables and any indication of significance. 
n=10 does mean that only 5 MV and 5 PEMF of the rats were investigated respectively? And measurements of the control group are missed?

7. Figure 3 and 4
It is difficult to locate the variations and limits of the three different VOIs and also which part of the CT describes the three different used groups.

8. References

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

Discretionary Revisions (which the author can choose to ignore)

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.