OBJECTIVES

Recognize the differential expression of OPG in the otic capsule of the adult male mice compared to other selected skeletal bones both in the nearby location as the temporal bone and in distant bones as the tibia.

METHODS

The present experimental study was conducted in 2011 on 20 normal adult male albino mice with average weight 50-60 gm. Animal housing at the Physiology department (Alexandria Faculty of Medicine) followed the rules of research ethics for experimental animals approved by Faculty of Medicine, University of Alexandria, Egypt.

The following bone specimens were harvested from normal adult male albino mice by microdissection: 1) temporal bone, 2) otic capsule bone surrounding the cochlea, and 3) tibia and stained immunohistochemically for anti-OPG monoclonal antibody.

RESULTS

OPG was detected as a brown DAB chromogen staining of tissue components expressing a positive OPG monoclonal antibody immune reactivity.

The present study aimed at characterizing osteoprotegerin (OPG) as one of the molecules responsible for the unique pattern of bone remodeling in the otic capsule.

In order to confirm this hypothesis, the expression of OPG in the otic capsule of mice has been compared to its expression in other skeletal bones known for undergoing a relatively higher rate of turnover and remodeling, namely the surrounding temporal bone and the tibia.

METHODS AND MATERIALS

The present experimental study was conducted in 2011 on 20 normal adult male albino mice with average weight 50-60 gm.

Harvesting of the specimens: The following specimens were collected from normal adult male albino mice by microdissection: 1) temporal bone 2) otic capsule bone surrounding the cochlea, and 3) tibia.

Preparation, immunohistochemical staining: The bone samples (temporal bone, otic capsule and tibia) were decalcified in 3% trichloroacetic acid solutions at room temperature for 14-21 days. When adequately softened, the samples were further processed into paraffin blocks 5-6 μm thick for preparation of hematoxylin and eosin sections and OPG immunolabeled sections respectively.

Method for image analysis: OPG was detected as a brown DAB chromogen. The stronger the immune reaction, the darker the DAB chromogen intensity. Positive staining was graded and analyzed using image software (MATLAB software version 5.5) that measure the staining intensity as units of pixels / microscopic field examined at 400 magnification computer program. The larger the pixel number, the weaker was the OPG immune expression.

DISCUSSION

Results found that high OPG level concentrations were found at otic capsule followed by the perilymph then temporal bone and finally the tibia. (Fig 1-4)

The statistical comparison between the mean pixel values for OPG immune reactivity in the different investigated areas indicated that the highest values were demonstrated in the tibia, followed by the temporal bone, then in the perilymph, in the base of the otic capsule and was lowest in apical part of the otic capsule. By interpreting these values in correlation to the corresponding strength of the OPG expression, this indicated that the greatest strength could be demonstrated in the apex and base of the otic capsule, followed by perilymph. It was least in the temporal bone and tibia. Differences in concentrations were statistically significant between all areas (Table 1).

REFERENCES