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P-01.135 Effect of SSRIs on human osteoclast formation and function

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Objective: SSRIs have been reported to regulate serotonin (5-HT) signalling in bone cells and thus may influence bone metabolism. In this study we investigated if SSRIs could influence human osteoclast (OC) formation and function in vitro.

Methods: Human OC generation and function was assessed in CFU-GM-derived cells treated with sRANKL (125 ng/mL) and hM-CSF (25 ng/mL) for 14 d. Resorbing activity of OC was assessed on dentine substrate. Cultures were treated with citalopram, sertraline, paroxetine, fluvoxamine or fluoxetine at 0.3 and 3.0 μ M and half-media changes were conducted bi-weekly with re-addition of treatments.

Results: At 3.0 μ M, sertraline and paroxetine decreased OC number (-23% and -28%) whereas citalopram increased OC number (+26%). Sertraline, fluoxetine and paroxetine increased OC size (+83%, +70 and +40%) but there was no effect on nuclei number per cell, indicating that size increases were due to cytoplasmic spreading and not cell fusion. Increased OC size was reflected in a general (non-sig.) trend for increased total OC area per slice for all compounds. Fluoxetine and paroxetine decreased resorption (-28% and -29%), whereas sertraline decreased resorption by 60%. Only sertraline decreased resorption per osteoclast (-47%) suggesting that the decreases in total resorption seen for fluoxetine and paroxetine may reflect a reduction in OC number, whereas sertraline may not only inhibit OC formation but also affect mature OC resorptive function. At 3 μ M there were no statistical differences in any of the parameters measured between control conditions and fluvoxamine. At 0.3 μ M, none of the SSRIs had any effect on any of the above measures.

Conclusion: SSRIs directly effect human OC formation and function and may alter bone homeostasis in vivo, however the nature and clinical significance of this effect is poorly understood. Considerable differences in effect on OC were observed between different SSRIs.