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THE EFFECT OF IBUPROFEN ON HEPATIC GLUTAMIC PYRUVIC TRANSAMINASE (SGPT), GLUTAMIC OXALOACETIC TRANSAMINASE (SGOT) AND ALKALINE PHOSPHATASE (ALP) IN DENTAL PATIENTS.

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ABSTRACT

Non-steroidal anti-inflammatory drugs (NSAIDs) are widely used in dentistry as analgesics and antipyretics. In the vast majority of emergencies, dental pain can be controlled with paracetemol, aspirin and ibuprofen, there are various levels of toothache ranging from occasional discomfort caused by early tooth decay, or periodontal disease, to the more severe, constant pain caused by advanced tooth decay and dental abscesses. Ibuprofen has been frequently and widely employed as analgesic and as anti-inflammatory agent in dental patients. Ibuprofen relieves pain and reduces fever and inflammation. The liver eliminates ibuprofen from the body. The process may work too slowly in some people, or liver enzymes may be altered, by high doses of ibuprofen, mainly: glutamic pyruvic transaminase (SGPT), that catalyzes the transfer of an amino group from alanine to a-ketoglutarate, the products of this reversible transamination reaction being pyruvate and glutamate. Glutamic oxaloacetic transaminase (SGOT)- that facilitates the conversion of aspartate and alpha-ketoglutarate to oxaloacetate and glutamate, and vice-versa. Both enzymes are normally present in liver and heart cells. They are released into blood when the liver or heart is damaged, thus levels are elevated with liver damage (viral hepatitis) or with an insult to the heart (heart attack). Some medications can also raise SGOTand SGPT levels. Alkaline phosphatase (ALP)- is hydrolase enzyme in the cells lining the biliary ducts of the liver as well as in bone and placental tissue, the enzyme is responsible for removing phosphate groups from many types of molecules, including nucleotides, proteins, and alkaloids. ALP levels in plasma will rise with large bile duct obstruction, intrahepatic cholestasis or infiltrative diseases of the liver and active bone formation occurring as ALP is a byproduct of osteoblast activity (such as the case in Paget's disease of bone), as well as in people with untreated coeliac disease. The purpose of the study was to identify toxic effects of ibuprofen for short term-therapy (not less than 5days) on liver function by assessment of hepatic SGPT, SGOT and ALP in intact people, who are under dental procedures, as well as in medically compromised dental patients. About 57 patients are investigated and were given several doses of ibuprofen. The main finding is an increase in ALP, as well as moderate to high elevation of SGPT and SGOT hepatic enzymes, but they remain around their normal ranges.

KEY WORDS: ibuprofen, glutamic pyruvic transaminase, alkaline phosphatase

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METHODOLOGY

The investigation of the studied ibuprofen substance has been carried out using three groups of people, according to dose of ibuprofen, prescribed for them. About 57 patients were investigated in a period of 4 month The serum of hepatic SGPT, SGOT and ALP were measured before and after treatment. The first group was treated with 200 mg of ibuprofen. The second group was treated with 400 mg of ibuprofen. The third group was treated with 600 mg of ibuprofen. The investigation includes about 32 males, 15 of them are smokers and 25 non smokers females, aging between 17-70 years of old.

METHODS OF INVESTIGATION & DISCUSSION

The result of investigation show that the serum ALP in the 3 investigated groups receiving ibuprofen is not significantly altered. Although there is a slight, moderate and high elevations in several patients receiving ibuprofen, depending on its dose, but it still around its normal range. In most patients of the first and third groups (especially females showing that hepatic metabolism of ibuprofen is slower that in males), receiving 2000 mg and 6000 mg respectively, the ALP serum had been elevated twice, in a few patients, the level of ALP is slightly increased, theses variant alterations may be associated with hepatic CYP as well as the age of patients. In the second group treated by 4000 mg of ibuprofen, ALP serum in a few patients had been increased twice of its concentration, but the percentage is less than that seen in patients of first and third groups. ALP is usually increased in hepatic, bone and celiac diseases, as well as cancer, polycythemia vera and hyperthyroidism. Certain medications can elevate ALP serum such as some antibiotics, allopurinol, methyldopa, antihyperglycemic agents and contraceptives. So that ibuprofen in its subsequent doses 200, 400 and 600 mg does not produce any significant effect on levels of ALP, that remain around its normal range in all investigated groups. Concerning SGPT in patients receiving 2000 mg, we found that the SGPT serum is slightly elevated in all patients, but the enzyme is still in its normal range, indicating that ibuprofen does not cause acute injury of hepatocytes at this dose. In patients of the second group treated with 400 mg, in both males and females the serum SGPT is more increased than the first group, owing to higher doses of ibuprofen, but levels didn't exceed normal ranges. The serum of SGPT in the third group receiving 6000 mg had been also elevated, but remaining in its normal range. The serum of SGPT is increased markedly in elderly patients, due to depressed their hepatic CYP system. The increase of SGPT is greater than that for first and second groups. Ibuprofen in 200, 400 and 600 mg doses has no significant toxicologic effect on SGPT in males and females, so it does not cause hepatic cell injury, in despite of decreased drug metabolism in some patients. In patients receiving 2000 and 4000 mg, the levels of SGOT are not markedly increased and still in their normative. Regarding SGOT levels, ibuprofen at a dose of 6000 mg increases its levels, more than levels of SGPT, but levels of SGOT still in normal parameters. However in one patient the SGOT is markedly decreased, may be due to its intermittent use. Ibuprofen in 200, 400 and 600 mg doses does not cause an elevation in SGOT, indicating that ibuprofen is not toxic to hepatocytes. So ibuprofen in 200, 400 and 600 mg does not cause injury of hepatocytes. The hepatic enzymes levels are not markedly increased before and after treatment.

CONCLUSION

1. Ibuprofen in 200, 400 and 600 doses is not toxic to hepatocytes, in several patients treated for about 5-7 days.
2. Ibuprofen in 200 and 400 mg doses does not elevate serum of ALP significantly, but in 600 mg dose more increases levels of ALP.
3. Ibuprofen causes no hepatocytes damage. The serum of SGOT and SGPT in 200, 400 and 600 mg doses in all patients doesn't exceed normal ranges.
4. Ibuprofen among other NSAIDs is the safest, and does not produce hepatitis.

5. The serum of ALP is not significantly elevated compared to SGPT and SGOT which is the most sensitive to ibuprofen.
6. The levels of hepatic enzymes in males are elevated more than female enzymes, because of physiologically decreased female hepatic metabolism.

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