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Synthesis of cyclooxygenase inhibitor 2-(1-benzyl-alkyl thio-5-imidazolyl)-3-pheenyl-1, 3-thiazolidin-4-one as anticancer agent

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Background and Aims: Recently study was shown that enzyme cyclooxygenase have a role in cancer tissue. Since the derivatives of thiazolidine 4-one and other pharmacophore patterns of central ring have a cox-2 inhibitory effect, thus we decide to synthesis of novel derivatives of thiazolidin -4-ones.
Methods: At first, benzyl amine hydrochloride was produced. Then the mixture of, dihydroxy acetone, thiocianate potassium was reacting for 72 h. By alkylation and oxidation formyl imidazole was obtained .The resultant aldehyde was reacted with aniline and thioglicolic in two ways including classic (in one and two step ways) and microwave method until the title compounds were obtained.
1-Classic Methods: In the one-step way,all the reactant (resultant aldehyde, aniline and thioglycolic) were refluxed in dean stark apparatus in dry toluene for 48 h. In the two-step way, at first aldehyde and aniline react in dean stark for 24 h to give intermediate imine, then thioglycolic acid was added and reacted for 24 h.
2- Microwave Methods: All of reactant was treated at 800 w, 100 c for 15 min.
Result and discussion: TLC was used to evaluate the progress of the reaction and purify material. Structure elucidation was done using NMR and IR spectrum.Yields of production of thiazolidone in both method is less than previous steps (80-90%).the yield of two-step method was about 10% more than one-step method . Microwave only decreased the time of reaction and the yield was unchanged.As the reaction is reversible, the water that is produced during the synthesis, takes the reaction to left side thus without using the dean stark and drying solvent, the yield decrease.

Keywords: Cyclooxygenase inhibitor; Thiazolidine 4-one derivatives; Anticancer