Triflusal
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Inhibition of platelet activation constitutes the main pharmacological method of preventing thrombotic events in human arteries. Antiplatelet agents are drugs that reduce thromocyte activation through different mechanisms including the inhibition of thromboxane A₂ synthesis: as this prostanoid induces platelet aggregation and vasoconstriction, inhibiting it reduces the aggregatory phenomenon.

Aspirin is an irreversible acetylator of cyclooxygenase (COX) both in platelets (resulting in decreased thromboxane production) and in the endothelium (causing decreased prostacyclin synthesis). Prostacyclin is a prostanoid that inhibits platelet aggregation and induces vasodilation; for this reason its inhibition is not recommended.

Triflusal is an antiplatelet agent which has been classed as an aspirin-like drug. Essential differences between aspirin and triflusal were suggested by some authors 15 years ago. Today it can be said that triflusal is not a specific type of aspirin but rather a completely different antiplatelet agent. This statement is based on the different activities of 3-hydroxy-4-trifluoro-methylbenzoic acid (HTB) and salicylic acid, which are the respective metabolites of triflusal and aspirin.

Triflusal inhibits both platelet and endothelial COX.⁴⁻⁵ Recovery of COX activity in platelets requires total replacement of the cells to restore thromboxane production (platelets have no nuclei); whereas, inhibition is reversible in endothelial cells where only the absence of the drug is required for restoration of prostacyclin synthesis. After its absorption into the blood, triflusal inhibits both platelet and endothelial COX but is then rapidly metabolised to HTB. Thus triflusal is eliminated from the blood, and endothelial cells can again produce prostacyclin; HTB does not affect COX activity.⁴⁻⁵ Supporting this, analysis of thromboxane and prostacyclin production 1 hour after triflusal administration reveals that the former is inhibited and the latter preserved.⁴⁻⁵

Moreover, HTB inhibits platelet aggregation in whole blood,³⁻⁵ by inhibiting cyclic adenosine monophosphate-phosphodiesterase (cAMP-PDE) and increasing intraplatelet cAMP content. Conversely, aspirin does not affect cAMP-PDE, and salicylic acid has no effects on either COX or cAMP-PDE.

In conclusion, administration of triflusal confers the activity of two different antiplatelet agents: inhibition of COX (by triflusal itself) and stimulation of cAMP (by HTB). These combined effects are important in obtaining an optimal inhibition of platelet activity, particularly when both are present in the same drug.

References
1. De La Cruz JP, Mata JM, Sanchez De La Cuesta F. Triflusal vs aspirin on the inhibition of human platelet and vascular cyclooxygenase. Gen Pharmacol 1992; 23 (3):297-300