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### Development of in situ mucoadhesive-thermosensitive gel of amoxicillin for intranasal delivery

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Acute Bacterial Rhinosinusitis (ABRs) is one of the most common upper respiratory tract infections caused by bacteria and infects the lining of the nasal cavity and sinuses. Amoxicillin is recommended as the first-line therapy for the treatment of ABRs. However, oral administration of Amoxicillin can affect systemic circulation and potentially cause some adverse reactions. Moreover, oral administration shows poor bioavailability due to the first-pass metabolism, leading to frequent dosing of therapy. Nasal drug delivery becomes an alternative approach as it allows delivery of the drug directly to the nasal cavity, provides higher drug concentrations locally, and has the potential to minimize systemic adverse effects.

This study aims to develop an intranasal formulation of Amoxicillin by the mucoadhesive thermo-gelling system that could possibly retain the drug in the nasal mucosa for a certain period of time while releasing the drug slowly to obtain optimal drug absorption. Bovine Serum Albumin will be employed as a drug-nanocarrier that might improve the permeability and retention profile of the preparation, as well as Poloxamer 407 as a thermosensitive polymer with the ability to undergo a sol-to-gel transition at nasal temperature.

A number of measurements will be carried out to investigate whether the characteristics of the formula are in accordance with the standard requirements for intranasal preparations such as particle size, polydispersity index, zeta potential, rheological study, gelling time, mucoadhesive strength, in vitro permeation study, drug release study, histopathological study and physical stability.

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