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A Note on Transmucosal Drug Delivery in the Oral Cavity

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ABOUT THE STUDY

There are several advantages to transmucosal drug delivery over traditional oral drug delivery. Among these are the avoidance of harsh acids and enzymes encountered during digestion. Additionally, the drug avoids first-pass metabolism in the liver and pre-systemic clearance in the gastrointestinal tract. Transmucosal administration is also an option when enteral administration is unavailable or difficult (e.g., in patients with nausea, vomiting or intestinal failure, and some pediatric patients). Moreover, it is a less invasive procedure than intravenous or intramuscular injections. This method does away with the need for technical equipment (such as pumps, catheters, and fluids) as well as the skill required for intravenous delivery. As a result, it is less costly. This is useful in dentistry because most general practitioners lack the technical knowledge and equipment needed to initiate IV lines and administer medications in this manner.

Another factor to consider with transmucosal administration is that some medications have an equivalent initiation of effect to intravenous drugs. The oral mucosa acts as an excellent barrier to certain medications spreading into the environment, hence this approach has some limitations in terms of absorption. As a result, this delivery strategy is best suited to high-potency medicines. Certain diseases, such as mucositis or blisters, might compromise the oral mucosa's integrity, making transmucosal drug administration ineffective. The oral cavity's key characteristics, numerous delivery techniques, and potential dental uses will all be discussed in this study.

The oral cavity is made up of a number of structures, including the oral mucosa, or lining, which contains sublingual, buccal, labial, palatal, and gingival tissues. The surface area of the oral mucosa is tiny compared to the skin or gastrointestinal tract, but it is highly vascularized, allowing agents direct access to systemic circulation v*ia* venous and capillary pathways. Because they are the most permeable, the sublingual and buccal gingiva are the major targets for transmucosal medication administration. The permeability of intraoral mucosa varies depending on cellular thickness and the amount of keratinized epithelium.

The sublingual mucosa has a structure comparable to that of the buccal mucosa. The sublingual mucosa, like the buccal mucosa, is nonkeratinized. The epithelial thickness is one distinguishing feature. The sublingual mucosa is 100 to 200 m long, whereas the buccal mucosa is 500 to 600 m long. Because of its thinness, the sublingual mucosa is relatively more permeable, and it receives less blood flow than the buccal mucosa.

The Buccal mucosa divides the area between the gingiva and the upper and lower lips, as well as segregating the inside lining of the cheek. It keeps extraneous chemicals from entering and protects the underlying tissues from chemical and mechanical injury. The outer epithelium and basement membrane are supported by lamina propria and submucosa connective tissue in a multilayer arrangement. Buccal epithelial cells are replaced every five to seven days with nonkeratinized stratified squamous epithelium.The gingiva and palate tissues are keratinized and have a thickness of 250 and 200 micrometers, respectively. Compared to the buccal and sublingual tissues, they are less porous. It's worth noting at this point that saliva is critical to the effectiveness of transmucosal medication delivery. Saliva is a mucus-rich environment with a lot of water. Mucin, which is mostly made up of glycoprotein, is the main component of mucus. Salivary flow helps determine how long a medicine stays in the oral cavity, therefore "saliva washout" might happen depending on the flow rate. There hasn't been much research into how this idea influences the efficiency of oral transmucosal medication administration.