News & Comments

Critical Areas of Drug-Anaesthetics Interaction

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Plants have long been involved in many traditional medical and therapeutic practices, as evidenced by artefacts from many periods of human history. Due to the rise of antimicrobial resistance in medications, this spark has been fanned decades later. According to the World Health Organization (WHO), more than 80% of the world relies on natural herbs to cure a variety of medical issues. Patients with chronic illnesses, on the other hand, are routinely or inadvertently given a medication regimen that includes multi-modal therapy with both conventional and herbal agents, which is frequently unknown to the clinical physicians who treat them, resulting in herb-drug interactions in the body that may or may not be fatal.

Pharmacodynamic and pharmacokinetic mechanisms regulate herb-drug interactions in the human body, with the latter being more difficult to explain than the former. The goal of this study was to anticipate the potential herb-drug interaction of Lidocaine, a local anaesthetic, with Capsaicin, a phytochemical used to relieve pain, as well as the proteins, biological pathways, and diseases involved.

ChemDIS Mixture was used in this prediction in silico analysis to identify the linked molecular pathways, proteins, and illnesses ontologies that are disturbed or involved as a result of the interactions of various medications in the human body.

This study was conducted on July 2020 to March 2021 in the Central Computational Laboratory of the Department of Anesthesiology, Taizhou Municipal People's Hospital, Taizhou, Jiangsu Province, 225300, China. Chem DIS-Mixture is a web-based database that offers two versions of the same program (4.0 and 5.0, respectively). The most recent version (v.5.0) is an improved version of the previous version, and it is important for drug interaction prediction because it can collect data from more databases for various medicines and phytochemicals. ChemDISMixture, like the STITCH database, has three different degrees of confidence score (low-0.15, medium-0.4, and high-0.7, respectively).

ChemDIS-Mixture was used to demonstrate the interaction of Lidocaine and Capsaicin in a systematic way. Some hyperlinked phrases emerged from the computational study, which was then downloaded and tabulated in Microsoft Excel®. The findings revealed that co-administration of Lidocaine and Capsaicin resulted in the generation of 947 overall effects in the human body, as well as 185 proteins related to both medicines. While ChemDIS-Mixture is an online tool that predicts putative drug-drug interactions between two or more medications, validation in the form of in vitro or in vivo research is always required, and can substantially contribute to authenticating the in silico prediction provided by this software.

Local anaesthetics work by interacting with and inhibiting sodium (Na+) channels, preventing sodium

from entering the cell. As a result, any subsequent side effects in the human body must be carefully monitored when herbs containing capsaicin are prescribed, as well as the case history of any patient receiving any therapy that necessitates the use of local anaesthetics like Lidocaine.

JOURNAL REFERENCE

Xue, Y., X. Ji, X. Li, T. Qian, M. Wang and L. Jiang, 2022. An in silico prognosis of local anesthetic interaction with sodium channel blockers. Int. J. Pharmacol., 18: 116-121.

KEYWORDS

Lidocaine, Capsaicin, antimicrobial resistance, multi-modal therapy, herb-drug interactions, ChemDIS-Mixture