

VOLUME 41, NUMBER 12
December 2024

ISSN 0189 - 160X

WAJM

WEST AFRICAN JOURNAL OF MEDICINE

ORIGINALITY AND EXCELLENCE IN MEDICINE AND SURGERY



OFFICIAL PUBLICATION OF
THE WEST AFRICAN COLLEGE OF PHYSICIANS *AND*
WEST AFRICAN COLLEGE OF SURGEONS



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Chemotherapy and Radiotherapy-Induced Oral Mucositis: The Potentials of Metabolomics in the Management

*La Mucosite Buccale Induite par la Chimiothérapie et la Radiothérapie:
Les Potentiels de la Métabolomique dans la Gestion*

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ABSTRACT

BACKGROUND: Oral mucositis (OM) is a debilitating complication commonly experienced by patients undergoing chemotherapy and/or radiotherapy for head and neck cancers. The pathogenesis of OM involves multifaceted interplay of inflammatory, immune, and cellular damage pathways triggered by cancer therapy. The pathogenesis of OM can be delineated into five overlapping phases: initiation, signaling, signal amplification, ulceration, and healing.

METABOLOMICS: the large-scale study of metabolites which are small molecules involved in cellular processes, has emerged as a powerful tool in understanding complex conditions like oral mucositis (OM). This detailed literature review synthesizes current knowledge on the metabolomics of OM, with a focus on its application to understanding the pathogenesis, identifying predictive biomarkers, and exploring therapeutic strategies.

CONCLUSION: The field of metabolomics has revolutionized the understanding of oral mucositis by providing a dynamic snapshot of the metabolic alterations associated with it. It is a powerful tool for identifying potential biomarkers for early diagnosis, monitoring, and treatment optimization.

WAJM 2024; 41 (12): 1205-1213

KEYWORDS: Oral mucositis, Metabolomics, Chemotherapy, Radiotherapy

RÉSUMÉ

CONTEXTE: La mucosite buccale (MB) est une complication invalidante couramment observée chez les patients recevant une chimiothérapie et/ou une radiothérapie pour des cancers de la tête et du cou. La pathogenèse de la MB implique une interaction complexe entre des voies inflammatoires, immunitaires et de dommages cellulaires déclenchées par la thérapie anticancéreuse. Elle peut être décrite en cinq phases chevauchantes : initiation, signalisation, amplification du signal, ulcération et cicatrisation.

MÉTABOLOMIQUE: La métabolomique, l'étude à grande échelle des métabolites qui sont des petites molécules impliquées dans les processus cellulaires, a émergé comme un outil puissant pour comprendre les conditions complexes telles que la mucosite buccale (MB). Cette revue détaillée de la littérature synthétise les connaissances actuelles sur la métabolomique de la MB, en se concentrant sur son application à la compréhension de la pathogenèse, l'identification de biomarqueurs prédictifs et l'exploration des stratégies thérapeutiques.

CONCLUSION: Le domaine de la métabolomique a révolutionné la compréhension de la mucosite buccale en fournissant un aperçu dynamique des altérations métaboliques qui lui sont associées. C'est un outil puissant pour identifier des biomarqueurs potentiels pour un diagnostic précoce, un suivi et une optimisation du traitement.

WAJM 2024; 41 (12): 1205-1213

MOTS-CLÉS : Mucosite buccale, Métabolomique, Chimiothérapie, Radiothérapie

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