HEALTH IMPACT OF RETINOIC ACID (ATRA) ON OVALBUMIN-SENSITIZED F344 RAT LUNGS AND IMPROVEMENT OF RELATED TISSUE PATHOLOGY BY CITRAL

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Abstract: The health impact of retinoic acid (All Trans Retinoic Acid; ATRA) in the development of lung pathology and tissue remodeling were not well established in the literature. As well, the role of citral (inhibitor of retinoid function) in the improvement of lung pathology was not ascertained under an in vivo setting. Therefore, it is hypothesized that ATRA and Ovalbumin exposure will sensitize lung tissues leading to lung tissue pathology and that citrals (C1 and C2) will reverse or ameliorate the related pathological damage to lung tissues. The study used an IACUC approved between-subject in vivo randomized split plot factorial design (F344 rat model; N=35). Animals were sensitized to OVA and then exposed to 6 different treatments including vehicle, ATRA, citrals (C1 and C2) and their combinations (OVA+ ATRA + C1, OVA+ ATRA + C2, by intra-peritoneal route. Rat weight data and blood were collected on Days 1 and 21, all animals were sacrificed on day 21 and lung tissues were processed for histopathology. Results from rat weights and blood (ANOVA and Duncan) as well as from the histopathological analysis of the exposure of F344 rats to OVA in combinations with ATRA and Citrals revealed various levels of lung tissue damage that was improved or worsened by either Citrals. We conclude that OVA+ATRA+C1 combination treatment did improve lung pathology as compared to single individual treatments. However, the OVA+ATRA+C2 combination not only failed to improve these parameters, but have also worsened the lung pathology of this model. This promising study showed variable responses on the interaction of ovalbumin, Citrals, and ATRA as related to their damage/improvement of related lung tissue pathologies.