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Metformin and the prevention of cancer... Where is the position in 2017?

Obesity and its metabolic complications, including diabetes, have been associated with an increased risk of several cancers. Thus, the potential use of Metformin as a novel cancer prevention strategy has generated much excitement in view of its low cost, favorable safety profile, and its potential for biological specificity in disrupting the association between obesity and cancer. Metformin seems to affect multiple key processes related to cell growth, proliferation, and survival which stem from both metabolic and intracellular-signaling activity. Metformin decreases hepatic glucose production and reduces the bloodstream level and cellular uptake of insulin which results in reduced activation of insulin receptors on cell membranes, triggering a cascade of intracellular molecular effects, which are often activated in many types of cancer cells, in addition to up regulation of AMP-activated protein kinase, a key molecule in glucose and insulin regulation and also an inhibitor of mTOR. Treatment with Metformin has been associated in meta-analysis of case–control and cohorts with reduced breast, colon and pancreas cancer risk, although RCTs confirmed the inverse association or showed no impact of Metformin. It should be remembered that RCTs that find no association between Metformin and cancer were designed to analyze other outcomes, did not include adequate confounding factors and follow-up was too short (maximum 4 years). Despite this evidence the latest meta-analysis shows that Metformin decreased risk only for cancers of the liver, pancreas, colorectal and stomach. A meta-analysis of 8 cohorts, involving 2805 pancreatic patients with diabetes, demonstrated a favorable result for pancreatic cancer with improved overall survival (HR=0.78, 95% CI=0.66-0.92). Metformin treatment is associated with a significant reduction in overall mortality irrespective of diabetes status in patients with endometrial cancer. Using Metformin as a cancer prevention strategy has been controversial and results have been inconsistent, but many analysis reveals that use of the drug is time-dependent, which may explain the disparity. Currently, doubt still remains whether the anti-cancer effects of Metformin observed in *in vitro* and in vivo studies will ultimately translate into clinical benefits in the ongoing clinical trials. While whether Metformin has a clinically-relevant chemo preventive or anti-cancer effect is not clear at present, the evidence from the ongoing human clinical trial studies will help to answer this critical issue.

Biography

Mahir Kh I Jallo is a Faculty in the Canadian Academy of Natural Health and Clinical Professor of Medicine and Consultant Endocrinologist in Gulf Medical University – UAE. He has granted his MB, ChB from Mosul Medical College in Iraq, his postgraduate Board Certification in Internal Medicine CABM from the Arab Board, his Fellowship of American College of Endocrinology FACE. He joined the JCI Accredited Thumbay Hospital in 2004 establishing the Diabetes and Endocrinology unit. He is an active participant and speaker in many national and international conferences and CME programs and organizer of the annual GMU diabetes and endocrinology conference since 2012. He is the Editor In Chief: diabetes digest from Iraq, Editorial Board Member and reviewer for many international diabetes and endocrinology journals, with many publications in medical periodicals and medical conferences abstract. He is active Principle Investigator in many National and International Clinical studies and Member of many national and international medical societies and associations..

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