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Glycemic control influence superoxide dismutase after Metformin therapy in diabetes mellitus-tuberculosis infection patients: A case report

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Poor glycemic control in Diabetes Mellitus (DM) patients has the potential to modify the risk of TB. In our knowledge, high glycemic index increases Superoxide Dismutase (SOD) for balancing oxidative stress-Reactive Oxygen Species (ROS) production. Metformin (MET), one of glycemic control drug, has effect in increasing SOD level and expects to contribute in the Isoniazid (INH)-induced bactericidal by increasing activation of INH pro-drug. However, the optimal glycemic control during anti-TB therapy in DM-TB infection remains unknown. An observational clinical study was done in DM-TB infection outpatients at Surabaya Paru Hospital. Glycemic index (HbA1c) evaluation was obtained during a 2-month MET therapy accompanying with insulin and anti-TB. As a comparison, control group, whom were not given MET, was also evaluated. The smear was measured two times as diagnostic and as evaluation. Superoxide Dismutase (SOD) level were also evaluated before and after this observation period. From 42 participants in this study, 22 participants of observation group that received additional MET therapy, 100% had sputum smear reversion conversion after 2-months intensive phase of anti-TB therapy. Whereas 25% of 20 participants of comparison group did not undergo reversion inserts sputum smear and needed additional anti-TB. Smear reversion was significantly difference, using Air Fisher's exact test, between the MET group and the control group. Moreover, SOD level was significantly different between MET group and the control group in HbA1c around 8.35%. Thus, we concluded that MET is a potential additive therapy to enhance the bactericidal effect of anti-TB on DM infected patients. Slightly poor-controlled glycemic index might contribute in enhanced anti-TB activity. However, since the number of samples was limited in this study, cohort study needs to be applied to support this data.

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