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Letter to the Editor

Silymarin therapy and improvement of cardiac outcome in patients with β-thalassemia major

Sir,

Thalassemia is a type of inherited hemolytic anemia characterized by abnormal formation of hemoglobin. The production of abnormal hemoglobin leads to red blood cells lysis.[1] Blood transfusion regime was the first effective approach in prolonging life in these patients. Multiple blood transfusions can result in iron excess.[1] Without appropriate iron chelation therapy, iron overload will happen in almost all patients with β-thalassemia major. Iron overload can lead to damage to the heart, liver, and endocrine system.[1] Cardiac complications such as cardiomyopathy and heart failure due to iron overload are the primary cause of mortality in β-thalassemia major.[1] It has been shown that almost 70% of deaths are related to this complication.[1] The cardiac siderosis related to iron overload can be prevented by standard chelation therapy with the medications such as deferoxamine, deferiprone, and deferasirox. Currently, some randomized clinical trials are carried out on these patients showing iron chelation effect and cardiac protective property of silymarin.[2] Silymarin, as a standardized extract of *Silybum marianum* (milk thistle) contains silybin (50%), silychristin (20%), silydianin (10%), and isosilybin (5%).[2] Silymarin has been utilized worldwide for many years as a complementary alternative medicine especially for treatment of hepatic diseases.[1] There are evidences of a trend of improved heart dysfunction following iron siderosis after silymarin therapy in the iron overload condition.[3-5] Raškovic *et al.*, in an *in vitro* study evaluated the protective role of silymarin on doxorubicin-induced heart damage. The combination of silymarin and doxorubicin was administered during 12 days in male Wistar rats. In the combination group, silymarin at a daily dosage of 60 mg/kg orally and doxorubicin at a dosage of 1.66 mg/kg every other day, intraperitoneally was used. They showed that silymarin significantly reduces histological changes in heart tissue after toxicity induced by doxorubicin.[3] Similarly, Aniss *et al.*, reported the same results with 5 mg/kg of doxorubicin, intraperitoneally and 200 mg/day/kg silymarin orally. These results revealed the cardioprotection effect of silymarin with the improvement of cardiac antioxidant statuses such as glutathione, superoxide dismutase, glutathione peroxidase, and catalase during doxorubicin-induced cardiac injury in an animal model.[4] It seems, decrease of oxidative stress markers such as reactive oxygen species inside of heart cells caused by strong antioxidant properties of silymarin and also its anti-inflammatory and cytoprotective effects could be responsible for cardioprotective effects[2,4,5] Moreover, silymarin protects rat cardiac myocytes through reduce of lactate dehydrogenase and malondialdehyde.[5] It increases superoxide dismutase activity as antioxidant agent and mitochondrial membrane potential and also its decreases Ca^{+2} inside cardiac cells.[5] To the best of our knowledge, there are few *in vitro* and *in vivo* studies that have evaluated the cardioprotective properties of silymarin in patients with β-thalassemia major. Considering probable iron chelation effect of silymarin[2] and the favorable safety profile, it could be reasonable to conduct the clinical researches to evaluate the cardioprotective effects of silymarin with hope to improve the life expectancy of thalassemia patients.

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