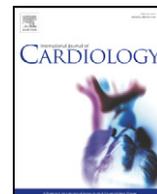




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Letter to the Editor

Avicenna's view on the prevention of thrombosis

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We are so glad to know that Avicenna medicine is being used after thousand years in several parts of the world. We appreciate the authors for their valuable experimental and clinical studies based on Avicenna medicine. We also like to thank the respected chief editor of the international journal of cardiology for giving us a chance to answer the ambiguous issues about thrombosis in Avicenna's view.

It seems that the main cause of Amat et al. ambiguities came from briefness of our letter, so we didn't mention many details. But according to your reader's interest, we found it necessary to complete those articles with more comprehensive contents. However, complexity of the issues needs a review article to clarify. So in this letter we only explain some important points in respect to Amat et al. comments.

Humors may affect each other; however, their quality and quantity are essentially related to other main causes such as 'six essential factors' (setteh zarorieh) including: 'air', 'foods and drinks', 'rest and activity', 'psychological factors', 'sleep and wakefulness' and 'retention and elimination'. For instance the material derived from food which is used for production of humor has a hot property in the case of safra and thick and dense property in the case of sauda.

As we said, the psychological factors also have an important role in producing humors. For example in a depressed patient, sauda, and in an angry person, safra will be produced more. Other factors such as digestive system and liver function are also having important role on humor production.

Although according to authors, deficient blood supply to the organ is in fact a sauda condition because of the absence of warming, moistening blood will produce a cold and dry temperament, but according to Avicenna this condition doesn't produce sauda. Avicenna says: 'It is

not proper to hold the belief that every temperament gives rise to its like and never, whether directly or indirectly, to its opposite. Sometimes it so happens that a temperament indirectly produces its contrary. Consequently, cold and dry temperament occasionally produces moisture that is alien to it. It is so not because there is some resemblance of extrinsic moisture with the cold and dry temperament but because coldness and dryness impair digestion. An example is the production of phlegm in the elderly people whose temperament is basically cold and dry. Thus, according to Avicenna, reduction of blood circulation doesn't produce sauda and the main cause of reduction of blood circulation is sauda's increscent [1].

Therefore humor's quality and quantity depend on different factors and every humor, as Avicenna has stated in details in canon of medicine, independently has certain and specific functions (Table 1).

We accept that all four humors are involved in producing thrombus but when we say that safra and sauda have key roles, it doesn't mean that we ignore blood and balgham. Although increscent of balgham can be the start of thrombus creation but thrombus's main factor is sauda. This theory is supported by the following clinical observations:

1. The authors have mentioned in their clinical studies in the coronary heart disease cases, coagulation–anticoagulation and fibrinolytic system function disorders the balgham syndrome has been predominated. However, the severe stages of these diseases are clinically connected with abnormal sauda syndrome [2].
2. In other studies, it has been said that coagulation–anticoagulation and fibrinolytic system function in different abnormal humor syndrome patients with CHD are abnormally changed, and this kind of changes is more serious in abnormal sauda syndrome groups than those in other three humors [2].
3. In another clinical study which has been done about the relationship between abnormal humors and coronary lesion and C-reactive protein, it has been recognized that in terms of degree of coronary lesion, balgham pattern was mild and abnormal sauda pattern was the severest and with the highest level of C-reactive protein [3].
4. Relationship between cardiovascular disease and depression has been proved in recent studies [4]. Patients with abnormal sauda have more depression symptom than patients with balgham. This relationship can be explained in this way that depression is one of the factors in human in which humors especially balgham condensate and freeze and turn to sauda [1].

Therefore, it's correct that in a certain disease the balance between all four humors can be disturbed, but actually imbalance in the quality

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Table 1
Properties and specific functions of humors.

Humor	Temperament	Properties and functions
Blood	Hot and wet	<ol style="list-style-type: none"> 1. The most excellent of all which is of a balanced nature and exceeds the other humors in quantity. 2. It feeds and growths of the body. 3. It heats and humid of the body. 4. It is the most essential and conducive to vitality.
Balgham	Cold and wet	<ol style="list-style-type: none"> 1. It is an imperfectly matured blood and is capable of transformation into blood whenever required. 2. It may mix up with blood and thus prepare it for the nourishment of the organs of phlegmatic temperament as in the brain. 3. It moistens the joints and the organs involved in frequent movement so that they may not become dry because of the heat generated by movement and friction.
Safra	Hot and dry	<ol style="list-style-type: none"> 1. It is the foamy part of the blood. 2. It is providing nourishment to those organs which deserve a sound part of bile included in their nourishment, as, for example, the lung. 3. It lies in the fact that it attenuates the blood and makes it penetrate narrow canals. 4. It washes out intestines to remove food residues and viscous phlegm. 5. It irritates the muscle of anus, so that it could feel the necessity to defecate.
Sauda	Cold and dry	<ol style="list-style-type: none"> 1. The normal sauda is the residue of good blood, sediment and its turbidity. 2. It thickens the blood and prevents it from flowing freely through the blood vessels. 3. It bestows stamina, strength, density and consistency to the blood. 4. It needs to mix up with the blood in a required quantity for the nourishment of each of those organs in the nutriment of which there must be a suitable portion of black bile as for example in the bones [1].

and/or quantity of one humor can produce humor imbalance. So regulation of this imbalanced humor can result in rebalance of other humors and cure. Upur et al. have correctly pointed this issue in their published articles. They have stated as such: “An excess or a deficiency in one or more body fluids will affect the human metabolism and cause disease” [5,6].

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