




## Editorial

# The Relationship between Food-Borne Parasites and Cardiovascular Diseases

V. Toupchi-Khosroshahi<sup>1,2</sup>, E. Mehrabi Nasab<sup>2,3\*</sup> 

1. Department of Cardiology, School of Medicine, Ayatollah Mousavi Hospital, Zanjan University of Medical Sciences, Zanjan, Iran

2. Department of Cardiology, School of Medicine, Valiasr Hospital, Zanjan University of Medical Sciences, Zanjan, Iran

3. Department of Cardiology, School of Medicine, Tehran Heart Center, Tehran University of Medical Sciences, Tehran, Iran

\* Corresponding author (E. Mehrabi Nasab)

✉ E-mail: emehrabinasab@gmail.com

ORCID ID: <https://orcid.org/0000-0003-2957-0480>

Cardiovascular disorders are considered as the most common reason of death in the world and include wide range of cardiac and vessels problems. Heart failure is one of the main cardiovascular diseases and is led to the impairment of heart in blood pumping. Heart failure patients present nonspecific symptoms such as paroxysmal nocturnal dyspnoea, dyspnoea, orthopnoea, whereas others are due to lack of adequate heart output, including fatigue, weakness, as well as exercise intolerance (Bozorgi et al., 2014, 2016).

Parasitic diseases have notable morbidity and mortality, particularly in developing countries and their effects on the cardiovascular system have been neglected. Food-borne parasites are very common in all countries and bear significant relationship with cardiac complications (Haddadzadeh et al., 2010; Hami et al., 2009; Yakhchali et al., 2009). Therefore, in clinic, more and deeper attention is needed for the potential mechanisms of the various cardiovascular diseases caused by parasitic invasion, such as myocarditis, cardiomyopathy, acute coronary syndrome, pericarditis, arrhythmias, pericardial effusion, cardiac dysfunction and endocarditis. In addition, cardiovascular responses can be triggered by parasite damage to other systems, such as pulmonary arterial hypertension by *Linguatula serrata* and schistosome, malaria-related anemia, celiac disease by lymphatic filariasis and other diseases (Bozorgi et al., 2016; Haddadzadeh et al., 2009; Zhang et al., 2022). It was presented that parasitic infections and related diseases increase the cardiovascular diseases incidence and the current concept was neglected

or had no more attention about food-borne parasites.

Chagas cardiomyopathy was presented in patients that were tested serologically positive for *Trypanosoma* and had typical heart disease symptoms such as abnormal electrocardiogram. Chronic status of this problem is characterized by right bundle branch or early left anterior bundle branch block and in severe ventricular arrhythmias, it can lead to heart failure. Almost, trichinosis has 21% mortality in patients with myocarditis and pericarditis is a widespread trichinosis manifestation. In addition, also amoebiasis, cysticercosis, and toxoplasmosis occasionally cause pericarditis. Additionally, amoebiasis, cysticercosis, and toxoplasmosis can occasionally cause pericarditis. Several malaria cases could have cardiovascular complications such as Acute Coronary Syndrome (ACS) and with trichinosis, ST-segment elevation myocardial infarction was reported (Nunes et al., 2018; Zhang et al., 2022). Therefore, parasitic infections have a significant correlation with the myocarditis and pericarditis development and it would be strongly with food-borne parasites. Notably, food-borne parasites in particular may be a neglected pathogenetic factor for diseases that complicate the cardiovascular system.

Additionally, some cysts from mature parasites including *L. serrata* (as one of the main food-borne parasitic species) can enter the heart and harm the heart tissue, which may lead to myocarditis or pericarditis. Because eosinophil is main responsible cell for parasite, eosinophilic myocarditis will be occurred that may lead to ACS (Haddadzadeh et al., 2009, 2010; Hami et al., 2009; Yakhchali et al., 2009)

© 2024, Shahid Sadoughi University of Medical Sciences. This is an open access article under the Creative Commons Attribution 4.0 International License.

**To cite:** Toupchi-Khosroshahi V., Mehrabi Nasab E. (2024). The relationship between food-borne parasites and cardiovascular diseases. *Journal of Food Quality and Hazards Control*. 11: 2-3.

The parasite presence is likely to increase exacerbation of cardiac arrhythmias and electrocardiogram (ECG) abnormalities. Arrhythmias management in Chagas cardiomyopathy patients is a major challenge and needs more effective therapies. On the other hand, several anti-parasite medications can alter in cardiac electrophysiology, such as amphotericin B and pentavalent antimony that have cardiotoxicity effects including QT interval prolongation, T-wave inversion, and ventricular tip-twisting. Tachycardia, premature atrial and ventricular beats and hypokalemia. African trypanosomiasis can result in dilated cardiomyopathy-like syndrome and an extensive endocardial fibrosis was observed in filariasis, which is an important cause of fatal arrhythmias and heart failure. Study of patients with Chagas and hypertension demonstrated elevations of B-type natriuretic peptide and high-sensitive cardiac troponin T (Bozorgi et al., 2016; Nunes et al., 2018; Zhang et al., 2022). As a result, the clinical management of patients with cardiovascular symptoms associated or suspected to parasitemia should be managed carefully and all mechanisms behind these problems require more attention and investigations.

## References

- Bozorgi A., Mehrabi Nasab E., Khoshnevis M., Dogmehchi E., Hamze G., Goodarzynejad H. (2016). Red cell distribution width and severe left ventricular dysfunction in ischemic heart failure. *Critical Pathways in Cardiology*. 15: 174-178. [DOI: 10.1097/HPC.000000000000094]
- Bozorgi A., Mehrabi Nasab E., Sardari A., Nejatian M., Nasirpour S., Sadeghi S. (2014). Effect of enhanced external counterpulsation (EECP) on exercise time duration and functional capacity in patients with refractory angina pectoris. *The Journal of Tehran University Heart Center*. 9: 33-37.
- Haddadzadeh H., Athari S.S., Hajimohammadi B. (2009). The first record of *Linguatula serrata* infection of two-humped camel (*Camelus bactrinus*) in Iran. *Iranian Journal of Parasitology*. 4: 59-61
- Haddadzadeh H.R., Athari S.S., Abedini R., Khazraii nia S., Khazraii nia P., Nabian S., Haji-Mohamadi B. (2010). One-humped camel (*Camelus dromedarius*) infestation with *Linguatula serrata* in Tabriz, Iran. *Iranian Journal of Arthropod-Borne Diseases*. 4: 54-59.
- Hami M., Naddaf S.R., Mobedi I., Zare-Bidaki M., Athari S.S., Hajimohammadi B., Anaraki-Mohammadi G. (2009). Prevalence of *Linguatula serrata* infection in domestic bovids slaughtered in Tabriz Abattoir, Iran. *Iranian Journal of Parasitology*. 4: 25-31.
- Nunes M.C.P., Beaton A., Acquatella H., Bern C., Bolger A.F., Echeverría L.E., Dutra W.O., Gascon J., Morillo C.A., Oliveira-Filho J., Ribeiro A.L.P., Marin-Neto J.A., et al. (2018). Chagas cardiomyopathy: an update of current clinical knowledge and management: a scientific statement from the American heart association. *Circulation*. 138: e169-e209. [DOI: 10.1161/CIR.000000000000599]
- Yakhchali M., Athari S.H., Hajimohammadi B., Raeisi M. (2009). Prevalence of *Linguatula serrata* in the ruminants slaughtered in Urmia slaughterhouse, Iran. *Journal of Veterinary Research*. 64: 329-332. [Iranian with English abstract]
- Zhang T., Jiang J., Liu J. (2022). Effects of parasitic diseases on the cardiovascular system. *Journal of Biosciences and Medicines*. 10: 90-102. [DOI: 10.4236/jbm.2022.106008]