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Editorial

Effect of corticosteroid on arrhythmic events in patients with cardiac sarcoidosis

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Sarcoidosis is a multisystem noncaseating granulomatous disease of unknown etiology. Pathologically, this granulomatous inflammation is characterized by accumulation of monocytes, macrophages, and activated T-lymphocytes, and there is evidence for a predominant type 1 T-helper cell response, resulting in an imbalance involving type 1 and type 2 helper-T cell cytokines and accelerated inflammation in sarcoidosis. It is most commonly observed in the lungs, but other organ systems (lymph nodes, skin, eyes, heart, nerves, and renal and endocrine systems) are also involved. Among them, cardiac sarcoidosis (CS) occurs in 20–27% of sarcoidosis patients in the USA and may occur more frequently in as many as 58% of patients in Japan [1–3] and has a poor outcome because of congestive heart failure, atrioventricular (AV) block, and ventricular tachyarrhythmias (VT). Therapy with corticosteroids or other immunosuppressant agents has been reported to be effective to prevent progression of these cardiac conditions and improve survival in patients with CS [4]. The mechanism of action of corticosteroids in CS is unknown, but it is thought that corticosteroids could relieve the progression of inflammation and fibrosis through re-establishing a normal balance between locally produced type 1 and type 2 helper-T cell cytokines [5], and thus early initiation of corticosteroids is recommended in CS patients.

AV block is the most common arrhythmia in CS and is reported in 26–67% of patients [6] due to involvement of the basal septum by a scar tissue or granulomas or the involvement of the nodal artery causing ischemia in the conduction system. Corticosteroids have been reported to be considered effective for the recovery of this AV block but not VT events in some CS patients (most of them were published from Japan) [7–9]. Kato et al. reported that recovery of AV conduction was observed in 4 of 7 treated patients (57.1%) and all 13 untreated patients had persistent complete AV block after 79.4 months [8]. Banba et al. also reported that recovery of AV conduction was observed in 5 of 9 treated patients (56.6%), in whom AV conduction improved to normal in 3 patients and to transient first-degree AV block in 2 patients after a relatively short period of 6 months [7]. In the recent systematic analysis review [10], 27 of 57 treated patients (47.4%) with AV block recovered AV conduction but none of the untreated patients improved. However, adequate dosage and long-term efficacy of corticosteroids on AV conduction system have not been proven to date.

The results of the study by Yodogawa [11] published in this journal have indicated the interesting possibility that corticosteroid therapy is effective not only for the recovery of AV conduction, but also to maintain AV conduction. They reported that 7 of 15 CS patients (46.7%) with complete AV block recovered to normal conduction or first-degree AV conduction after corticosteroids (acute dose of 30 mg/day and maintenance dose of 5–10 mg/day) and this effect was sustained at least during a mean follow-up period of 7.1 years. They also reported that the recovery group had a higher left ventricular ejection fraction (69.4% vs. 44.1%) and a higher prevalence of advanced AV block (87.5% vs. 28.6%), indicating that early initiation of corticosteroids should be recommended in CS. Similar results were also reported by Banba et al. that positive Gallium-67 uptake was correlated with new onset of high-grade AV block but not VT episodes (80% in AV block vs. 14% in VT, $p < 0.02$) [7]. These retrospective data indicates that AV block in CS develops mainly during the early, active, and inflammatory phase of the disease, and there is relatively higher possibility of AV conduction recovery after corticosteroid therapy. However, in view of the unpredictable response, all patients diagnosed with CS should receive pacemaker implantation.

Unlike in the case of AV block, the effect of corticosteroids on VT was not consistent in the previous reports. A favorable effect was reported by Futamatsu et al. [12] and Yodogawa et al. (the patients were included in this study) [9], but amiodarone was started concomitantly in the former report and only the reduction of ventricular premature contractions and nonsustained VT in the subgroup of patients with left ventricular ejection fraction >35% in the latter group. Because it appears likely that in many cases VT is related to scar formation, corticosteroids might have little beneficial effect on VT events. Thus, CS patients with VT should receive an implantable cardioverter defibrillator.

In conclusion, although the number of patients in this study was small and a further prospective registry or randomized study is needed to reach a definitive conclusion, Yodogawa et al. have provided important clinical evidence suggesting that early initiation of corticosteroid therapy is effective for the recovery of AV block in CS patients and may be a possible therapeutic strategy for some selected CS patients.

References

[1] Matsui Y, Iwai K, Tachibana T, Fruie T, Shigematsu N, Izumi T, Homma AH, Mikami R, Hongo O, Hiraga Y, Yamamoto M. Clinicopathological study of fatal myocardial sarcoidosis. Ann N Y Acad Sci 1976;278:455–69.
[2] Roberts WC, McAllister Jr HA, Ferrans VJ. Sarcoidosis of the heart. A clinicopathologic study of 35 necropsy patients (group 1) and review of 78 previously described necropsy patients (group 11). Am J Med 1977;63:86–108.

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http://dx.doi.org/10.1016/j.jjcc.2013.09.004

[3] Silverman KJ, Hutchins GM, Bulkley BH. Cardiac sarcoid: a clinicopathologic study of 84 unselected patients with systemic sarcoidosis. Circulation 1978;58:1204–11.
[4] Yazaki Y, Isobe M, Hiroe M, Morimoto S, Hiramitsu S, Nakano T, Izumi T, Sekiguchi M, Central Japan Heart Study G. Prognostic determinants of long-term survival in japanese patients with cardiac sarcoidosis treated with prednisone. Am J Cardiol 2001;88:1006–10.
[5] Newman LS, Rose CS, Maier LA. Sarcoidosis. N Engl J Med 1997;336:1224–34.
[6] Kim JS, Judson MA, Donnino R, Gold M, Cooper Jr LT, Prystowsky EN, Prystowsky S. Cardiac sarcoidosis. Am Heart J 2009;157:9–21.
[7] Banba K, Kusano KF, Nakamura K, Morita H, Ogawa A, Ohtsuka F, Ogo KO, Nishii N, Watanabe A, Nagase S, Sakuragi S, Ohe T. Relationship between arrhythmogenesis and disease activity in cardiac sarcoidosis. Heart Rhythm 2007;4:1292–9.
[8] Kato Y, Morimoto S, Uemura A, Hiramitsu S, Ito T, Hishida H. Efficacy of corticosteroids in sarcoidosis presenting with atrioventricular block. Sarcoidosis Vasc Diffuse Lung Dis 2003;20:133–7.
[9] Yodogawa K, Seino Y, Ohara T, Takayama H, Katoh T, Mizuno K. Effect of corticosteroid therapy on ventricular arrhythmias in patients with cardiac sarcoidosis. Ann Noninvasive Electrocardiol 2011;16:140–7.
[10] Sadek MM, Yung D, Birnie DH, Beanlands RS, Nery PB. Corticosteroid therapy for cardiac sarcoidosis: a systematic review. Can J Cardiol 2013;29:1034–41.
[11] Yodogawa K. Recovery of atrioventricualr block following steroid therapy in patients with cardiac sarcoidosis. J Cardiol 2013;62:320–5.
[12] Futamatsu H, Suzuki J, Adachi S, Okada H, Otomo K, Ohara T, Hashimoto Y, Kakuta T, Iesaka Y, Yamaguchi H, Sakurada H, Sato A, Obayashi T, Niwa A, Hirao K, et al. Utility of gallium-67 scintigraphy for evaluation of cardiac sarcoidosis with ventricular tachycardia. Int J Cardiovasc Imaging 2006;22:443–8.

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