SARKOİD ÜRƏK: NECƏ TANIYAQ VƏ KİMİNŁƏ TƏQİB EDƏK?

HAZIRLADI: FESC. DR. CƏMİL BABAYEV
WHO ARE YOU?
It was first described in 1877 by Dr. Jonathan Hutchinson, a dermatologist as a condition causing red, raised rashes on the face, arms, and hands.\[^{15}\]

In 1889 the term lupus pernio was coined by Dr. Ernest Besnier, another dermatologist.\[^{170}\]

Later in 1892 lupus pernio's histology was defined.\[^{170}\]

In 1902 bone involvement was first described by a group of three doctors.\[^{170}\]
Between 1909 and 1910 uveitis in sarcoidosis was first described, and later in 1915 it was emphasised, by Dr. Jörgen Nielsen Schaumann, that it was a systemic condition.\[^{170}\]

This same year lung involvement was also described.\[^{170}\]

In 1937 uveoparotid fever was first described and likewise in 1941 Löfgren syndrome was first described.\[^{170}\]

In 1958 the first international conference on sarcoidosis was called in London, likewise the first USA sarcoidosis conference occurred in Washington, D.C., in the year 1961.\[^{170}\]

It has also been called Besnier–Boeck disease or Besnier–Boeck–Schaumann disease.\[^{171}\]

First Heart Sarcoidosis was identified in 1929 by M.Bernstein.
Cardiac Sarcoidosis

Epidemiology, Characteristics, and Outcome Over 25 Years in a Nationwide Study

Riina Kandolin, MD; Jukka Lehtonen, MD; Juhani Airaksinen, MD; Tanani Vihinen, MD; Heikki Miettinen, MD; Kari Ylitalo, MD; Kari Kaikkonen, MD; Petri Haataja, MD; Tuomas Kerola, MD; Jorma Kokkonen, MD; Päivi Pietilä-Effati, MD; Seppo Utrianen, MD; Markku Vihinen, MD

Background—This study was designed to assess the epidemiology, characteristics, and outcome of cardiac sarcoidosis (CS) in Finland.

Methods and Results—We identified in retrospect all adult (>18 years of age) patients with a confirmed CS diagnosis in Finland between 1988 and 2012. A total of 110 patients (71 women) met the study criteria.

Conclusions

The number of patients with manifest CS seen annually in Finland increased >20-fold from 1988 to 2012, most likely as a result of improved diagnostic methods and heightened diagnostic activity. The majority of patients had clinically isolated
Effects of Sarcoidosis

- **Nervous system:**
  - Meningitis
  - Encephalitis

- **Lacrimal gland granuloma**

- **Heart:**
  - Pericarditis
  - Arrhythmias

- **Hilar and mediastinal lymph node granulomas**

- **Lung granulomas**

- **Liver:**
  - Granulomatous hepatitis

- **Spleen:**
  - Splenomegaly

- **Lymph nodes**

- **Joints:**
  - Arthritis

- **Skin:**
  - Erythema nodosum
  - Subcutaneous nodules

- **Histopathology:**
  - Non-caseating granuloma

- **15%** of cases affects the nervous system

- **90%** of cases affects the lungs and lymph nodes

- **10%** of cases affects the heart

- **25%** of cases affects the liver

- **65%** of cases affects the skin

- **33%** of cases affects the bones and joints
Cardiac sarcoidosis occurs in up to a third of all sarcoidosis patients.

**Cardiac Sarcoidosis**

- **Dizziness and/or fainting spells**
- **Chest pain**
- **Tests include:**
  - Electrocardiogram (ECG)
  - Echocardiogram (Echo)
  - Magnetic Resonance Imaging (MRI)
  - Nuclear Scans Holter monitor

**Irregular Heartbeat**
- Pounding or fluttering sensation or a ‘skipping of beats’

**Shortness of Breath**

**Swelling of the legs and/or ankles**
- In later stages

**Pulmonary Hypertension**
- This is when the heart is indirectly affected as a result of sarcoidosis in the lungs. This can affect up to 15% of patients with sarcoidosis.

KLİNİKA:
Cardiac Sarcoidosis: Clinical Manifestations, Imaging Characteristics, and Therapeutic Approach

Brian A. Houston\(^1\) and Monica Mukherjee\(^2\)

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Table 1. Clinical Manifestations of Cardiac Sarcoidosis.

<table>
<thead>
<tr>
<th>Clinical Diagnosis Group*</th>
<th>CLINICAL MANIFESTATION</th>
<th>REPORTED PREVALENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Clinical Criteria</td>
<td><strong>Arrhythmias</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AV block</td>
<td>26–62%</td>
</tr>
<tr>
<td></td>
<td>Bundle Branch Block</td>
<td>12–61%</td>
</tr>
<tr>
<td></td>
<td>Supraventricular Tachycardia</td>
<td>0–15%</td>
</tr>
<tr>
<td></td>
<td>Ventricular Tachycardia</td>
<td>2–42%</td>
</tr>
<tr>
<td></td>
<td>Sudden Cardiac Death</td>
<td>12–65%</td>
</tr>
<tr>
<td>Minor Clinical Criteria</td>
<td><strong>Cardiomyopathy</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Congestive heart failure</td>
<td>10–30%</td>
</tr>
<tr>
<td></td>
<td>• Left ventricular systolic failure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Heart failure with preserved ejection fraction or restrictive disease</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Right ventricular failure secondary to pulmonary disease</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Pericardial</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Pericardial effusion detected by echo (common)</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>• Pericarditis (rare)</td>
<td></td>
</tr>
</tbody>
</table>
Outcomes of Cardiac Sarcoidosis Presenting with High-Grade Atrioventricular Block

Cardiac sarcoidosis, n=325
Presentation with high-grade atrioventricular block, n=143

Subgroups by ejection fraction (EF, n=139) and ventricular tachycardia (VT) at the time of presentation:
- EF<35% or VT+, n=20
  - 30% 5-year cumulative incidence of sudden cardiac death
- EF 35-50% and VT-, n=29
  - 14% 5-year cumulative incidence of sudden cardiac death
- EF >50% and VT-, n=90
  - 9% 5-year cumulative incidence of sudden cardiac death

Implantation of an intracardiac cardioverter defibrillator instead of a pacemaker should be considered!
EXOKARDİOQRAM:

- Sol mədəciyin atım fraksiyası
- Seqmentar divar hərəkət gűsuru
- Sol və sağ mədəciyin 3 D strain
- Perikard
- Plevra
- Qulaqçıqlar
- Qapaqlar

Figure 1. Echocardiogram, parasternal long axis view, of a 33-year-old patient with CS. Note the thinned, notched aneurysmal segment in the basal anteroseptal wall (red arrow).
<table>
<thead>
<tr>
<th>StudyId</th>
<th>Sensitivity (95% CI)</th>
<th>StudyId</th>
<th>Specificity (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahmadian A</td>
<td>0.95 [0.77 - 1.00]</td>
<td>Ahmadian A</td>
<td>0.88 [0.62 - 0.98]</td>
</tr>
<tr>
<td>Ambrosini V</td>
<td>0.33 [0.01 - 0.91]</td>
<td>Ambrosini V</td>
<td>0.96 [0.86 - 1.00]</td>
</tr>
<tr>
<td>Blankstein R</td>
<td>0.42 [0.26 - 0.59]</td>
<td>Blankstein R</td>
<td>0.80 [0.69 - 0.88]</td>
</tr>
<tr>
<td>Gormsen LC</td>
<td>0.33 [0.01 - 0.91]</td>
<td>Gormsen LC</td>
<td>0.88 [0.62 - 0.98]</td>
</tr>
<tr>
<td>Ishimaru S</td>
<td>1.00 [0.48 - 1.00]</td>
<td>Ishimaru S</td>
<td>0.81 [0.62 - 0.94]</td>
</tr>
<tr>
<td>Ito K</td>
<td>0.75 [0.35 - 0.97]</td>
<td>Ito K</td>
<td>0.73 [0.39 - 0.94]</td>
</tr>
<tr>
<td>Langah R</td>
<td>0.85 [0.62 - 0.97]</td>
<td>Langah R</td>
<td>0.90 [0.55 - 1.00]</td>
</tr>
<tr>
<td>Manabe O</td>
<td>0.93 [0.76 - 0.99]</td>
<td>Manabe O</td>
<td>0.69 [0.50 - 0.84]</td>
</tr>
<tr>
<td>Momose M</td>
<td>0.74 [0.54 - 0.89]</td>
<td>Momose M</td>
<td>0.80 [0.59 - 0.93]</td>
</tr>
<tr>
<td>Norikane T</td>
<td>0.85 [0.55 - 0.98]</td>
<td>Norikane T</td>
<td>1.00 [0.59 - 1.00]</td>
</tr>
<tr>
<td>Ohira H</td>
<td>0.88 [0.47 - 1.00]</td>
<td>Ohira H</td>
<td>0.38 [0.14 - 0.68]</td>
</tr>
<tr>
<td>Okumura W</td>
<td>1.00 [0.72 - 1.00]</td>
<td>Okumura W</td>
<td>0.91 [0.59 - 1.00]</td>
</tr>
<tr>
<td>Schildt JV</td>
<td>0.69 [0.55 - 0.82]</td>
<td>Schildt JV</td>
<td>0.93 [0.89 - 0.97]</td>
</tr>
<tr>
<td>Soussan M</td>
<td>0.50 [0.27 - 0.73]</td>
<td>Soussan M</td>
<td>0.95 [0.82 - 0.99]</td>
</tr>
<tr>
<td>Tahara N</td>
<td>1.00 [0.74 - 1.00]</td>
<td>Tahara N</td>
<td>0.33 [0.10 - 0.65]</td>
</tr>
<tr>
<td>Yokoyama R</td>
<td>0.97 [0.86 - 1.00]</td>
<td>Yokoyama R</td>
<td>0.83 [0.71 - 0.92]</td>
</tr>
<tr>
<td>Youssef G</td>
<td>0.79 [0.49 - 0.95]</td>
<td>Youssef G</td>
<td>0.70 [0.35 - 0.93]</td>
</tr>
<tr>
<td>COMBINED</td>
<td>0.84 [0.71 - 0.91]</td>
<td>COMBINED</td>
<td>0.83 [0.74 - 0.89]</td>
</tr>
</tbody>
</table>

Q = 71.35, df = 16.00, p = 0.00
I² = 77.58 [67.27 - 87.86]

Q = 80.07, df = 16.00, p = 0.00
I² = 80.02 [71.12 - 88.92]
CONCLUSIONS

CMR imaging with LGE provides important prognostic risk stratification for patients with known or suspected CS. Patients with the presence of LGE are at increased risk of death from any cause and arrhythmogenic events, even if their cardiac function is normal or near normal. This study illustrates how the presence or absence of LGE likely has important implications for optimizing therapy in patients with known or suspected CS.

Clinical outcomes of patients with known or suspected cardiac sarcoid with the presence or absence of LGE on CMR. Composite outcome of all-cause mortality plus arrhythmogenic events stratified by LVEF; arrhythmogenic events defined as ventricular arrhythmias (ventricular tachycardia/ventricular fibrillation), sudden cardiac death, and appropriate implantable cardioverter-defibrillator discharge/aborted sudden cardiac death. CI = confidence interval; M-H = Mantel-Haenszel odds ratio; other abbreviations as in Figures 1 and 2.
Diagnostic Accuracy of Cardiac MRI versus FDG PET for Cardiac Sarcoidosis: A Systematic Review and Meta-Analysis

Matthew Aitken, Matthew D. F. McInnes, Mark Paaladinesh Thavendiranatha

Results

Thirty-three studies were included (1997 patients, 687 with cardiac sarcoidosis); 17 studies evaluated cardiac MRI (1031 patients) and 26 evaluated FDG PET (1363 patients). Six studies directly compared cardiac MRI and PET in the same patients (303 patients). Cardiac MRI had higher sensitivity than FDG PET (95% vs 84%; P = .002), with no difference in specificity (85% vs 82%; P = .85). In a sensitivity analysis restricted to studies with direct comparison, point estimates were similar to those from the overall analysis: cardiac MRI and FDG PET had sensitivities of 92% and 81% and specificities of 72% and 82%, respectively. Covariate analysis demonstrated that sensitivity for FDG PET was highest with quantitative versus qualitative evaluation (93% vs 76%; P = .01), whereas sensitivity for MRI was highest with inclusion of T2 imaging (99% vs 88%; P = .001). Thirty studies were at risk of bias.

Conclusion

Cardiac MRI had higher sensitivity than fluorodeoxyglucose PET for diagnosis of cardiac sarcoidosis but similar specificity. Limitations, including risk of bias and few studies with direct comparison, necessitate additional study.
<table>
<thead>
<tr>
<th>Likelihood Probability</th>
<th>MRI Likelihood</th>
<th>MRI Example</th>
<th>MRI Example Illustrated</th>
<th>PET Likelihood</th>
<th>PET Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>No CS (&lt;10%)</td>
<td>- No LGE</td>
<td><img src="image1" alt="MRI Example" /></td>
<td><img src="image2" alt="MRI Example Illustrated" /></td>
<td>- No FDG uptake and no perfusion defect</td>
<td><img src="image3" alt="PET Example" /></td>
</tr>
<tr>
<td>Possible CS (50-90%)</td>
<td>- One focal areas of LGE but alternative diagnoses was more likely (e.g., Pulmonary hypertension)</td>
<td><img src="image4" alt="MRI Example" /></td>
<td><img src="image5" alt="MRI Example Illustrated" /></td>
<td>- No FDG uptake but a small perfusion defect.</td>
<td><img src="image6" alt="PET Example" /></td>
</tr>
<tr>
<td>Probable CS (50-50%)</td>
<td>- Multifocal LGE in a pattern that is likely consistent with CS but cannot rule out other diagnoses (e.g., myocarditis)</td>
<td><img src="image7" alt="MRI Example" /></td>
<td><img src="image8" alt="MRI Example Illustrated" /></td>
<td>- Multiple non-contiguous areas of scar with no FDG uptake.</td>
<td><img src="image9" alt="PET Example" /></td>
</tr>
<tr>
<td>Highly Probable (&gt;90%)</td>
<td>- Multifocal LGE in a pattern strongly consistent with CS with no alternative diagnosis.</td>
<td><img src="image10" alt="MRI Example" /></td>
<td><img src="image11" alt="MRI Example Illustrated" /></td>
<td>- Multiple areas of focal FDG uptake AND extracardiac FDG.</td>
<td><img src="image12" alt="PET Example" /></td>
</tr>
</tbody>
</table>

*Non-specific FDG uptake and no perfusion defects.*
Underdiagnosis of cardiac sarcoidosis by ECG and echocardiography in cases of extracardiac sarcoidosis


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(a) Normal ECG and TTE
- Positive: 24 (73%)
- Negative: 9 (27%)

(b) Abnormal ECG and/or TTE
- Positive: 42 (53%)
- Negative: 37 (47%)

(b) Normal ECG and TTE
- Positive: 14 (42%)
- Negative: 19 (58%)

(b) Abnormal ECG and/or TTE
- Positive: 56 (71%)
- Negative: 23 (29%)
Figure 1: Common cardiac pathologies in native and contrast enhanced T1-mapping, T2w TSE and LGE.
BİOPSİYA:
Etioloqiya və Patoqenez əsaslı müalicə
Müalicə Prinsipləri:
<table>
<thead>
<tr>
<th>Drug name</th>
<th>Suggested dose range</th>
<th>Special treatment issues/monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-Line Agents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corticosteroids</td>
<td>20–40 mg/day initial dose, tapered to 7.5–15 mg/day</td>
<td>Bone density, Eye exams (glaucoma and cataracts), Body Mass Index</td>
</tr>
<tr>
<td>Prednisone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second-Line Agents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methotrexate</td>
<td>7.5–25 mg/week orally or subcutaneously</td>
<td>Concurrent need for folic acid, Liver function, kidney function, CBC, Can cause hepatotoxicity, GI distress, pneumonitis, mouth ulcers, bone marrow suppression.</td>
</tr>
<tr>
<td>Hydroxychloroquine</td>
<td>200–400 mg/day</td>
<td>Eye exams for retinopathy, Rarely associated with QT elongation (consider drug interactions), Liver function, kidney function, CBC.</td>
</tr>
<tr>
<td>Leflunomide</td>
<td>10–20 mg/day</td>
<td>Can cause neuropathy, hepatotoxicity, GI distress, pneumonitis, bone marrow suppression. In cases of toxicity, can clear more urgently with cholestyramine.</td>
</tr>
<tr>
<td>Azathioprine</td>
<td>50–200 mg/day</td>
<td>Liver function, kidney function, CBC, Consider TPMT level. Can cause hepatotoxicity, GI distress, hypersensitivity reaction, bone marrow suppression.</td>
</tr>
<tr>
<td>Mycophenolate</td>
<td>500–3,000 mg/day</td>
<td>Liver function, kidney function, CBC, Associated with GI distress, bone marrow suppression. Enteric coated option available (different dose range).</td>
</tr>
<tr>
<td>Third-Line Agents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infliximab</td>
<td>3–5 mg/kg intravenously at weeks 0, 2, and every 4–8 weeks thereafter</td>
<td>Tuberculosis Testing, Caution in heart failure, Allergic reactions possible with injections, Associated with demyelination syndrome, malignancy, and sarcoid-like reactions.</td>
</tr>
<tr>
<td>Adalimumab</td>
<td>40 mg subcutaneous every 1–2 weeks</td>
<td>Similar precautions and adverse reactions as infliximab.</td>
</tr>
</tbody>
</table>
Kim əqiib etsin?

Cardiac Sarcoidosis Clinic Overview

At Mayo Clinic, people with symptoms that indicate they might have cardiac sarcoidosis receive diagnosis and treatment from a team of experts in the Cardiac Sarcoidosis Clinic. These services are available at Mayo Clinic's campuses in Arizona, Florida and Minnesota.
Sarcoidosis

Sarcoidosis is a condition that causes lumps or nodules (granulomas) to form in your lungs, lymph nodes, skin, eyes and other parts of your body. Symptoms include cough, shortness of breath, tender sores on your shins, eye pain and redness. Many cases go away on their own or with treatment, but sometimes it becomes a chronic condition.
TAKE HOME MESSAGE:

1. Sarkoidoz, geniş yayılmış olmasada, ÜÇ və ciddi Ritm pozulmasının səbəblərindən biridir!
2. Diaqnostik metodlar təkminləşdikcə xəstə papulasiyası artır!
3. Erkən diaqnostika, erkən müalicə deməkdir!
4. Exokardioqrafiya mütləkdir!
5. PET və ya MRT, seçim sizindir!
6. Zamanla ayaqlaşmaq sizin əlinizdədir!
W A Y

WHO ARE YOU?
DİQQETİNİZƏ GÖRƏ TƏŞƏKKÜRLƏR!!!