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MANAGEMENT OF ACUTE PERICARDITIS SUSPECTING AT FAMILY MEDICINE

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Abstract:

In this review, we discuss diagnostic methods if this condition was suspected by family doctor, also clinical presentation to rule out and treatment methods if this disease was approved. For this Review we searched MEDLINE, EMBASE, CINAHL. To search CENTRAL and MEDLINE we combined the following search strategy with the mesh terms for identifying the relevant studies published up to August, 2019 acute pericarditis in family medicine" "primary care" "management" AND "family physicians". Pericarditis is a cause of chest ache with numerous etiologies. Acute pericarditis is a self-limiting disorder without considerable complications or recurrences in 70% to 90% of patients. Regardless of improvements in diagnostic methods there remains a substantial variety of patients with acute pericarditis, the etiology of which cannot be classified precisely. This latter group will be tightened just after additional professional description and clinical research study. The diagnosis of nonspecific pericarditis needs to be made thoroughly as a result of similarity of its start to that of myocardial infarction and its benign program with propensity to relapse.

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INTRODUCTION:

The pericardium, originated from the Greek languages περί which means around and κάρδιον means heart, is a thin fibroelastic sac, which has the heart and the origins of the great vessels. There are two layers, the first one is a serous visceral (internal portion) and a fibrous parietal layer (outer section). In physiologic problems, the pericardial cavity has 10-50 mL of plasma ultrafiltrate (i.e., pericardial liquid) [1]. Ailments of the pericardium cause a diverse bunch of pathologies, ranging from benign congenital structural irregularities, such as pericardial cyst, to life-threatening entities, such as cardiac tamponade and constrictive pericarditis. Although pericardial illness is not uncommon in daily basis, cardiologists usually tend to be less aware about taking care of these diseases. This is main reason of a delay in the medical diagnosis (patients with tightness may have been dealt with for "refractory" heart failure for many years) or insufficient or poor treatment.

Pericarditis is inflammation of the pericardial sac. There are few main pericardial disorders encompass pericarditis (acute, subacute, chronic, recurrent), pericardial effusion, cardiac tamponade and pericardial masses. Pericarditis is the most widespread type of pericardial ailment worldwide and generally young and middle-aged people experience this problem [2]. It accounts for 0.2% of all hospital admissions of cardiovascular aetiology and around 5% of patients with non-ischaemic aetiology chest ache, offering in the emergency divisions of North America and Western Europe [2]. Acute pericarditis is the most usual pericardial syndrome in professional practice [2].

Acute pericarditis is common disease in several medical settings, where it may be the very first demonstration of a systemic illness or may stand for an isolated process. In this review, we discuss diagnostic methods if this condition was suspected by family doctor, also clinical presentation to rule out and treatment methods if this disease was approved.

METHODOLOGY:

For this Review we searched MEDLINE, EMBASE, CINAHL. To search CENTRAL and MEDLINE we combined the following search strategy with the mesh terms for identifying the relevant studies published up to August, 2019 acute pericarditis in family medicine" "primary care" "management" AND "family physicians". Only English language articles were searched with human subject content. Furthermore, references list of each articles were reviewed for more related articles to our concerned topic.

DISCUSSION:

Etiology:

Usually, when pericardium is healthy, it contains the internal serous visceral layer and the outer fibrous parietal layer that wrap up the heart. Approximately 15 to 50 mL of liquid, an ultrafiltrate of plasma, divides these layers. A systemic ailment or a process separated to the pericardium (Table 1) most immunocompetent patients lead to acute pericarditis, viral or idiopathic etiologies prevail, and it has to be taken into consideration [5]. Local to the heart, acute pericarditis can occur second to an MI or a dissecting aortic aneurysm. Systemic problems, such as hatred, inflammatory feedbacks, autoimmune disorders (e.g., rheumatoid arthritis), and uremia, can precipitate acute pericarditis. There are more another external reasons apart from viral infections such as pharmacologic agents (e.g., hydralazine, isoniazid), radiation treatment, blunt or sharp injury to the thoracic cavity, and bacterial infection [5]. However, a lot of etiologic analyses are undetermined.

Table 1. Causes of Pericarditis [3-4].

1.Idiopathic (nonspecific, probably viral)
2.Infectious causes
Viruses: coxsackievirus A and B, hepatitis viruses, human immunodeficiency virus, influenza, measles virus, mumps virus, varicella virus
Bacteria: gram-positive and gram-negative organisms; rarely, Mycobacterium tuberculosis
Fungi (most common in immunocompromised patients): Blastomyces dermatitidis, Candida species, Histoplasma capsulatum
Echinococcus granulosus
3.Noninfectious causes
Acute myocardial infarction*
Aortic dissection
Renal failure†
Malignancy: breast cancer, lung cancer, Hodgkin's disease, leukemia, lymphoma by local invasion

Radiation therapy (usually for breast or lung cancer) Chest trauma Postpericardiotomy Cardiac procedures: catheterization, pacemaker placement, ablation Autoimmune disorders: mixed connective tissue disorder, hypothyroidism, inflammatory bowel disease, rheumatoid arthritis, scleroderma, spondyloarthropathies, systemic lupus erythematosus, Wegener's granulomatosis Sarcoidosis **4.Medications** Dantrolene (Dantrium), doxorubicin (Adriamycin), hydralazine (Apresoline; brand not available in the United States), isoniazid (INH), mesalamine (Rowasa), methysergide (Sansert; brand not available in United States), penicillin, phenytoin (Dilantin), procainamide (Procanbid), rifampin (Rifadin)

Pathophysiology And Classification:

The acute inflammatory feedback in pericarditis may produce serous fluid, pus, or dense fibrinous product which depends on the many external reasons. A tiny amount of serous fluid accumulates usually because of viral pericarditis that settle spontaneously or call for marginal restorative intervention. However, large amounts of serous liquid (as much as 250 mL) will not be able to trigger considerable scientific indications or signs if accumulation is gradual. The effusion can be detected only by chest radiograph as a big cardiac silhouette [6]. Albeit, vast acute accumulations of pericardial fluid may be the reason of rising intrapericardial stress, thus impeding filling of the best side of the heart with the superior vena cava and inferior vena cava. Furthermore, cardiac tamponade is one of the consequences of mentioned circumstance. If the pericarditis procedure proceeds and the fluid organizes right into an enlarged (even calcified) layer, the resultant constrictive pericarditis might imitate restrictive cardiomyopathy [7]. Thus, pericarditis may be categorized as acute, subacute, or chronic, relying on the underlying pathophysiologic process (Table 2).

Table 2. Classification of Pericarditis **[7].**

Acute pericarditis (<6 weeks)
Effusive
Fibrinous
Subacute pericarditis (>6 weeks to 6 months)
Chronic pericarditis (>6 months)
Effusive
Adhesive
Effusive adhesive
Constrictive

Clinical Presentation:

Acute pericarditis can be described as an "inflammatory pericardial disorder which comes together or not with pericardial effusion" [8]. Relaying on the 2 of the given criterias the diagnose could be made: a) pericardial abrasions during auscultation, b) pericardial chest ache, c) intensive ST-elevation or depression on PR during ECG, and d) pericardial effusion (worsening or new). To support the findings are altitude of inflammatory criterias and computed tomography (CT) or cardiac magnetic resonance (CMR) proof of inflammation of pericardium [8]. Concrete indications as temperature level > 38 ° C, subacute beginning, large pericardial effusion (> 20 mm) or tamponade and ot responding to nonsteroidal anti-inflammatory drugs (NSAIDs) or aspirin are main features of bad prediction. Small aspects contain concomitant myocarditis, immunosuppression, injury and oral anticoagulant therapy [8].

Individuals who has acute pericarditis offenly have chest pain (> 85-90% of instances), which generally travels to the left shoulder, trapezius ridge, or arm and appears like ischaemic pain. Nonetheless, retrosternal pain in acute pericarditis is mostly pleuritic and sharp, and increases during lying setting, with coughing and deep inspiring in. On the other hand, pain mostly lowers in the standing placement and by leaning onward, because to comparingly low pressure on the parietal pericardium [9]. Usual related indications and features consist of low-grade periodic fever, coughing, dyspnoea, malaise, myalgia and occasionally hiccoughs. The case history usually discloses symptoms suggestive of viral infection.

Auscultation shows a pericardial friction rub (pathognomonic indication for pericarditis), because of boosted friction of irritated layers of pericardium, in regarding 33 percent of individuals with acute pericarditis. It is a superficial scratchy or squealing tone, which can be better heard with the diaphragm of the stethoscope upper that left sternal border when individual is leaning front. It normally contains 3 stages, corresponding to motion of the heart during atrial systole (absent in atrial fibrillation), ventricular systole and the quick loading stage of early ventricular diastole [9]. Occasionally, pericardial rub has just two components and even one part. Especially, pericardial abrasion rub can vanish not only during recovering of pericarditis, however additionally during advancement of more pericardial liquid in the pericardial cavity, showing either betterment or escalation of the disease. On top of that, abrasion rub in acute pericarditis can have difference in tensity from point to point, which hardly ever appears with the other types of pericarditis. The auscultation of pericardial abrasion rub is extremely concrete for acute pericarditis (uniqueness around 100%).

Table 3. Diagnostic criteria [8],[9]. (Two of the four should be present)

Typical chest pain
Pericardial friction rub
Suggestive ECG changes
New or worsening pericardial effusion

Diagnosis:

Physical examination:

Physical exam of a patient who presents with upper body discomfort includes primarily a cardio evaluation. Blood pressure ought to be determined in both arms and the patient analyzed for presence of:

- acute changes in essential signs, with specific interest to indicators of shock (ie diaphoresis, clamminess, tachycardia, lowered high blood pressure).
- pulsus paradoxus.
- raised jugular venous pressure (JVP).
- modifications in heart or lung sounds.
- peripheral oedema.

Just like the history taking, respiratory system, abdominal and localised bone and joint exams are additionally likely to be indicated. Usual root causes of upper body pain are received Table 1 [10].

Table 4. Chest pain reasons experienced in general practice, compared with emergency departments [10].

	Percentage in general practice (%)	**Percentage in emergency departments (%)**
Musculoskeletal conditions	29	7
Respiratory conditions, including pneumonia, pneumothorax and lung cancer	20	12
Psychosocial conditions	17	9
Serious cardiovascular conditions, including myocardial infarction, unstable angina, pulmonary embolism and heart failure	13	54
Gastrointestinal conditions	10	3
Stable coronary artery disease	8	13
Non-specific causes	11	15

Electrocardiographic evaluation:

Electrocardiography (ECG) is valuable in the medical diagnosis of acute pericarditis. Typically, it discloses diffuse ST sector altitudes (concave up) and down-sloping PR sector clinical depressions in about 80% of patients. The ECG changes result from surface myocardial swelling [11]. ECG adjustments develop in four phases over hours to weeks, and any of these symptoms might exist at the time of presentation:

a. Stage 1- diffuse ST section altitudes that are concave up in all leads other than V1 and aVR, with down-sloping PR section anxiety in a lot of leads however specifically leads II, aVF, and V4 - V6, but not in leads V1 and aVR.

b. Stage 2 - ST and Public Relations sectors stabilize and T waves squash.
c. Stage 3 - diffuse T wave inversion.
d. Stage 4 - T waves return to baseline, and resolution of the adjustments [12].

The time frame of the advancement of these ECG adjustments was explained in 50 patients with acute pericarditis. Phase 1 was noted after only 0.5 days of signs, and originally just PR section clinical depressions were seen. Stage 2 happened about 1.5 days from symptoms beginning and revealed both ST adjustments as well as Public Relations sector anxieties. Stage 3 happened 9.1 days from presentation, whereas resolution or phase 4 was noted on days 10 - 11 [11]. Electrical alternans, defined as beat-to-beat oscillating QRS axes seen on ECG, can indicate a huge pericardial effusion due to rotation of the heart in an increased quantity of pericardial liquid.

Application of imaging in acute pericarditis:
Numerous imaging methods help the clinician in precise medical diagnosis. If there is greater than 250 mL of fluid in the pericardial area, the chest X-ray will certainly show a bigger cardiac silhouette [13].

The 2004 European Society of Cardiology (ESC) standards advise echocardiography if pericarditis is thought given that the existence of a pericardial effusion can help in the management and medical diagnosis [14]. Relying on the size of the effusion, little effusions are denoted as <10 mm of fluid, moderate effusions as 10–20 mm of fluid, and severe effusions when >< 10 mm of fluid, modest effusions as 10 - 20 mm of liquid, and extreme effusions when > 20 mm of liquid exists [15]. While an echo will show an effusion in approximately 60% of instances, it is not required for diagnosis [15].

Management:
General recommendations, physical activity and lifestyle changes:
While the diagnostic examinations are not normalized (i.e., CRP, ECG and echocardiogram) it is highly recommended to limit physical activity to no more than is usual for individuals not associated with affordable sports. A shorter duration (up until remission) may suit for non-athletes [16].

Prognosis:
Most individuals with acute pericarditis (normally those with assumed viral or idiopathic pericarditis) have a good long-term diagnosis [17]. Cardiac tamponade hardly ever happens in patients with acute idiopathic pericarditis and is extra typical in patients with a detail underlying aetiology such as malignancy, TB or purulent pericarditis. The threat of creating tightness can be categorized as low (1%) for idiopathic and assumed viral pericarditis, intermediate (2-5%) for autoimmune, immune-mediated and neoplastic aetiologies, and high (20-30%) for bacterial aetiologies, particularly with TB and purulent pericarditis. Around 15-30% of patients with idiopathic acute pericarditis who are not treated with colchicine will create either persistent or constant ailment, while colchicine might halve the reappearance rate [18].

Pharmacologic therapy for acute pericarditis:
Aspirin or NSAIDs are pillars of therapy for acute pericarditis [19]. If research laboratory data sustain the medical diagnosis, symptomatic treatment with NSAIDs should be launched. As a result of its outstanding security, the recommended NSAIDs is Ibuprofen in a dosage of 600 to 800 mg by mouth three times daily with discontinuation if pain is no more present after two weeks [9]. Numerous patients have really satisfying responses to the initial or second dose of the NSAIDs, and the majority of respond fully, without requirement for added treatment. The selection of medication need to be based on the medical history of the patient consisting of contraindications, previous efficacy or adverse effects, the visibility of concomitant ailments, favoring aspirin over other NSAIDs when aspirin is already needed as antiplatelet therapy, and finally the doctor's professional abilities and expertise [21]. Dependable patients without any greater than small effusions, who respond well to NSAIDs, need not be confessed to healthcare facility [22]. Patients who do not respond well originally, that have bigger effusions, or that have a suspected cause apart from idiopathic pericarditis must be hospitalized for added monitoring, analysis testing and therapy. Patients who react gradually or improperly to NSAIDs might call for auxiliary numbing anesthetics to allow time for a complete feedback or a course of colchicine [23]. Colchicine is suggested at low, weight-adjusted doses to boost the feedback to clinical therapy and stop recurrences [24]. Colchicine is provided as a 2 to 3 mg oral loading dosage complied with by 1 mg daily for 3 months [25]. It is uncommon not to attain a satisfying response to a program of NSAIDs with colchicine included. Colchicine has been proposed as a common adjuvant to NSAIDs for preliminary treatment [26]. The dosing of one of the most typically recommended anti-inflammatory treatment for acute pericarditis is presented in Table 1 [18].

Table 5. Dosing of the most commonly prescribed anti-inflammatory therapy for acute pericarditis.

Drugs	Usual dosing	Treatment duration	Tapering*
Aspirin	750-1,000 mg every 8 hrs	1-2 weeks	Decrease doses by 250-500 mg every 1-2 weeks
Ibuprofen	600 mg every 8 hrs	1-2 weeks	Decrease doses by 200-400 mg every 1-2 weeks
Colchicine	0.5 mg once (<70 kg) or 0.5 mg twice daily (>70 kg)	3 months	Not mandatory, alternatively 0.5 mg every other day (<70 kg) or 0.5 mg once (>70 kg) in the last weeks

*Tapering should be considered for aspirin and non-steroidal anti-inflammatory drugs.

Therapy period is symptoms and CRP led however usually 1- 2 weeks for uncomplicated situations. Gastroprotection needs to be given. Colchicine is added on top of aspirin or NSAIDs.

Poorly reacting patients have typically been treated with short courses of corticosteroids [20]. Corticosteroids must be taken into consideration as a second choice in patients with contraindications and failing of pain killers or NSAIDs due to the threat of favoring the chronic development of the illness and advertising. In this situation they are utilized with colchicine. Nonetheless, corticosteroids ought to be prevented as they appear to urge reoccurrences [19]. If they merely cannot be stayed clear of to take care of a preliminary episode, it is advised to use prednisone, reduced to moderate dosages 0.2-0.5 mg/kg/day or comparable rather than high dosages (i.e., prednisone 1.0 mg/kg/day or equivalent). The first dosage ought to be kept till resolution of symptoms and normalization of CRP, after that tapering should be considered.

CONCLUSION:

Pericarditis is a cause of chest ache with numerous etiologies. Acute pericarditis is a self-limiting disorder without considerable complications or recurrences in 70% to 90% of patients. Regardless of improvements in diagnostic methods there remains a substantial variety of patients with acute pericarditis, the etiology of which cannot be classified precisely. This latter group will be tightened just after additional professional description and clinical research study. The diagnosis of nonspecific pericarditis needs to be made thoroughly as a result of similarity of its start to that of myocardial infarction and its benign program with propensity to relapse. The treatment of acute pericarditis has been significantly enhanced by the introduction of the antibiotic medications. The treatment of pericarditis has not altered for several years. The existing fads of tapering NSAIDs, and various other anti-inflammatories, mainly colchicine, are transforming the way we approach treatment of primary pericarditis.

REFERENCES:

1. Snyder MJ, Bepko J, White M. Acute pericarditis: diagnosis and management. Am Fam Physician. 2014 Apr 1;89(7):553-60.
2. Klein AL, Abbara S, Agler DA, Appleton CP, Asher CR, Hoit B, Hung J, Garcia MJ, Kronzon I, Oh JK, Rodriguez ER, Schaff HV, Schoenhagen P, Tan CD, White RD. American Society of Echocardiography clinical recommendations for multimodality cardiovascular imaging of patients with pericardial disease: endorsed by the Society for Cardiovascular Magnetic Resonance and Society of Cardiovascular Computed Tomography. J Am Soc Echocardiogr. 2013 Sep;26(9):965-1012.e15.
3. Maisch B, Ristic AD. The classification of pericardial disease in the age of modern medicine. Curr Cardiol Rep. 2002;4:13–21.
4. Goland S, Caspi A, Malnick SD. Idiopathic chronic pericardial effusion [Letter]. N Engl J Med. 2000;342:1449.
5. Lange RA, Hillis LD. Clinical practice. Acute pericarditis [published correction appears in N Engl J Med. 2005;352(11):1163]. N Engl J Med. 2004;351(21):2195–2202.
6. Murphy JG. Mayo Clinic cardiology review. 2d ed. Philadelphia: Lippincott Williams & Wilkins, 2000: 509-32.
7. Myers RB, Spodick DH. Constrictive pericarditis: clinical and pathophysiologic characteristics. Am Heart J 1999;138(2 pt 1):219-32.
8. Markel G, Imazio M, Koren-Morag N, Galore-Haskel G, Schachter J, Besser M, Cumetti D, Maestroni S, Altman A, Shoenfeld Y, Brucato A, Adler Y. CEACAM1 and MICA as novel serum biomarkers in patients with acute and recurrent

pericarditis. Oncotarget. 2016 Apr 5;7(14):17885-95.
9. Imazio M, Brucato A, Barbieri A, Ferroni F, Maestroni S, Ligabue G, Chinaglia A, Cumetti D, Della Casa G, Bonomi F, Mantovani F, Di Corato P, Lugli R, Faletti R, Leuzzi S, Bonamini R, Modena MG, Belli R. Good prognosis for pericarditis with and without myocardial involvement: results from a multicenter, prospective cohort study. Circulation. 2013 Jul 2;128(1):42-9.
10. Buntinx F, Knockaert D, Bruyninckx R, et al. Chest pain in general practice or in the hospital emergency department: Is it the same? Fam Pract 2001;18(6):586–89.
11. Baljepally R, Spodick DH. PR-segment deviation as the initial electrocardiographic response in acute pericarditis. Am J Cardiol. 1998;81(12):1505–1506.
12. Ginzton LE, Laks MM. The differential diagnosis of acute pericarditis from the normal variant: new electrocardiographic criteria. Circulation. 1982;65(5):1004–1009.
13. Goyle KK, Walling AD. Diagnosing pericarditis. Am Fam Physician. 2002;66(9):1695–1702.
14. Maisch B, Seferović PM, Ristić AD, et al. Guidelines on the diagnosis and management of pericardial diseases executive summary; The Task Force on the Diagnosis and Management of Pericardial Diseases of the European Society of Cardiology. Eur Heart J. 2004;25(7):587–610.
15. Weitzman LB, Tinker WP, Kronzon I, Cohen ML, Glassman E, Spencer FC. The incidence and natural history of pericardial effusion after cardiac surgery – an echocardiographic study. Circulation. 1984;69(3):506–511.
16. Imazio M, Brucato A, Belli R, Forno D, Ferro S, Trinchero R, Adler Y. Colchicine for the prevention of pericarditis: what we know and what we do not know in 2014 - systematic review and meta-analysis. J Cardiovasc Med (Hagerstown). 2014 Dec;15(12):840-6.
17. Imazio M, Brucato A, Mayosi BM, Derosa FG, Lestuzzi C, Macor A, Trinchero R, Spodick DH, Adler Y. Medical therapy of pericardial diseases: part II: noninfectious pericarditis, pericardial effusion and constrictive pericarditis. J Cardiovasc Med (Hagerstown). 2010 Nov;11(11):785-94.
18. Imazio M, Brucato A, Trinchero R, Spodick D, Adler Y. Individualized therapy for pericarditis. Expert Rev Cardiovasc Ther. 2009 Aug;7(8):965-75.
19. Lilly LS. Treatment of acute and recurrent idiopathic pericarditis. Circulation. 2013 Apr 23; 127(16):1723-6.
20. Imazio M, Brucato A, Mayosi BM, Derosa FG, Lestuzzi C, Macor A, Trinchero R, Spodick DH, Adler Y. Medical therapy of pericardial diseases: part I: idiopathic and infectious pericarditis. J Cardiovasc Med (Hagerstown). 2010 Oct;11(10):712-22.
21. Seidenberg PH, Haynes J. Pericarditis: diagnosis, management, and return to play. Curr Sports Med Rep. 2006 Apr;5(2):74-9.
22. Imazio M, Cecchi E, Demichelis B, Lema S, Demarie D, Ghisio A, Pomary F, Coda L, Belli R. Trinchero R. Indicators of poor prognosis of acute pericarditis. Circulation. 2007 May 29;115(21):2739-44.
23. Imazio M, Brucato A, Derosa FG, Lestuzzi C, Bombani E, Scipione F, Leuzzi S, Cecchi E, Trinchero R, Adler Y. Aetiological diagnosis in acute and recurrent pericarditis: when and how. J Cardiovasc Med (Hagerstown). 2009 Mar;10(3):217-30.
24. Adler Y, Charron P, Imazio M, Badano L, Barón-Esquivias G, Bogaert J, Brucato A, Gueret P, Klingel K, Lionis C, Maisch B, Mayosi B, Pavie A, Ristić AD, Sabaté Tenas M, Seferovic P, Swedberg K, Tomkowski W, Achenbach S, Agewall S, Al-Attar N, Angel Ferrer J, Arad M, Asteggiano R, Bueno H, Caforio AL, Carerj S, Ceconi C, Evangelista A, Flachskampf F, Giannakoulas G, Gielen S, Habib G, Kolh P, Lambrinou E, Lancellotti P, Lazaros G, Linhart A, Meurin P, Nieman K, Piepoli MF, Price S, Roos-Hesselink J, Roubille F, Ruschitzka F, Sagristà Sauleda J, Sousa-Uva M, Uwe Voigt J, Luis Zamorano J; European Society of Cardiology (ESC). 2015 ESC Guidelines for the diagnosis and management of pericardial diseases: The Task Force for the Diagnosis and Management of Pericardial Diseases of the European Society of Cardiology (ESC) Endorsed by: The European Association for Cardio-Thoracic Surgery (EACTS). Eur Heart J. 2015 Nov 7;36(42):2921-64.

25. Pelliccia A, Corrado D, Bjornstad HH, Panhuyzen-Goedkoop N, Urhausen A, Carre F, Anastasakis A, Vanhees L, Arbustini E, Priori S. Recommendations for participation in competitive sport and leisure-time physical activity in individuals with cardiomyopathies, myocarditis and pericarditis. Eur J Cardiovasc Prev Rehabil. 2006 Dec;13(6):876-85.
26. Imazio M, Gaita F. Diagnosis and treatment of pericarditis. Heart. 2015 Jul;101(14):1159-68.