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Case report

Unexplained heart failure and stroke

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Abstract Infective endocarditis is an infection of the endocardial surface of the heart that usually involves the valves. Late diagnosis can lead to severe complications, such as heart failure, or even death. We have presented the case of a patient who was admitted with several months' history of heart failure symptoms, intermittent fever, shiver and periodic neurological symptoms. MRI of endocranium depicted multiple ischemic lesions. Repeated transthoracic echocardiographies were done, thus setting the definitive diagnosis of the aortic valve endocarditis. Patient was treated with antibiotics according to guidelines and antibiogram. The surgical intervention in form of replacement of aortic valve was undergone; both early and later postoperative course was without complications. One should consider differential diagnosis of infective endocarditis in case of long term, unexplained fever, new onset of heart murmur and presence of risk factors.

Key words left-sided endocarditis, aortic valve, heart failure, embolic complications of infective endocarditis

Introduction

Infective endocarditis is an infection of the endocardial surface of the heart that usually involves the valves (tough it can affect other structures as well) and is caused by bacteria or fungi[1]. When not adequately diagnosed and treated, it leads to heart failure or death[2]. Clinical manifestations of infective endocarditis can be quite variable, thus making its diagnosis often challenging[3]. The most cases present themselves with fever, vegetation in echocardiography and positive blood culture[1]. However, infective endocarditis is heterogeneous not only in clinical manifestation and course, but also in etiology. The predominant causing microorganism is Staphylococcus aureus, usually causing acute, fulminant forms of disease. Other possible pathogens are streptococci, enterococci, as well as less common Candida or Aspergillus[4]. Typical laboratory findings in infective endocarditis include normocytic anemia, while white blood cell number usually remains normal[5]. Maior diagnostic criteria is evidence of bacteriemia or fungemia[5]. Several risk factors are related to infective endocarditis, such are old age, immunological deprivation, bacterial resistance, hemodialysis, intracardiac devices, prosthetic valves, degenerative and congenital heart diseases, rheumatic heart disease, inadequate dental hygiene, lack of prophylaxis for dental and invasive procedures, intravenous therapy or drug use, piercings, tattoo, and nail biting[1,5,6]. Infective endocarditis is connected with various severe complications, such are heart failure, uncontrolled or persisting infection, perivalvular infective extensions, embolic events, infectious aneurysms, myocarditis and pericarditis, heart rhythm disturbances, acute renal failure, and many others[7]. Treatment relies upon eradication of microorganisms from vegetation, which implies using bactericidal medications in high concentrations and for a long period of time[2,3,7]. Heart failure, uncontrolled infection and large vegetations are indication for surgical intervention, it's timing depending upon the size of vegetation as well as clinical picture[4,6,7].

Case Report

A 48 year old man was admitted to Institute of Cardiovascular Diseases of Vojvodina as a transfer from Institute for Pulmonary Diseases due to clinical signs of congestive heart failure. He presented himself with symptoms of dyspnea, fatigue (that accelerated during physical activity) and swelling of lower extremities. The symptoms had lasted eight months prior to admission, and exacerbated approximately 3 weeks prior to admission. He denied having chest pains. He has had constant shiver and occasional fever (up to 38˚C) past six months prior to admission and received several rounds of antibiotics under diagnosis of respiratory infection during that time.

He had been hospitalized at the Institute for Pulmonary Diseases of Vojvodina prior to admission to Clinic of Cardiology under the suspicion of pulmonary embolism. CT pneumoangiography discarded pulmonary embolism, and on the other hand, CT showed bilateral pleural effusions and bilateral emphysema in upper lobes. Diagnostic thoracentesis was performed; pleural effusion was defined as transudate. Echocardiography was also

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performed; it showed globally hypokinetic, hypertrophic left ventricle, decreased global systolic function (ejection fraction 40%), second grade diastolic dysfunction, mild mitral regurgitation and mild-moderate aortic regurgitation with minor calcification of right coronary cusp.

He had undergone neurological examination earlier that year (due to persistent headaches and transitory problems with vision), when he was diagnosed with low graded glial brain tumor, after a CT scan. Neurosurgeon did not indicate operative treatment, and on subsequent MR imaging the lesion was not described as tumor, but brain infarction with hemorrhagic transformation. He has had renal calculosis and consequent renal failure. When risk factors for cardiovascular diseases are concerned, he has suffered from insulin dependent diabetes mellitus, arterial hypertension, he has smoked for many years.

The patient did not have fever under admission. Physical examination unraveled systolic murmur over precordium, discrete ankle edema, as well as signs of left sided pleural effusion.

Baseline laboratory tests showed hemoglobin 105 g/l; MCV 80 fl; MCH 26,8 pg; MCHC 334 g/l; leukocytes – 11,9x10^9/l; neutrophils – 10,0x10^9/l ; international normalized ratio (INR) – 1,23; blood glucose - 5,2 mmol/l; blood glucose 26,5 mmol/l; urea 16,2 mmol/l; creatinine 183 micromol/l; uric acid 508 micromol/l; AST 159 U/l; ALT 234 U/l; LDH 276 U/l; proteins 59 g/l; albumin 23 g/l; CRP 46,5 mg/l; Procalcitonine 1,13; NT-proBNP 10824 pg/ml.

Treatment was started with intravenous diuretics among with adequate hydration, inotrope stimulation, as well as empiric parenteral antibiotic treatment (Ceftriaxone) under suspicion of community-acquired pneumonia that escalated on the basis of pulmonary congestion. Initial therapy led to partial clinical improvement; laboratory tests showed significant improvement of inflammatory, renal and hepatic parameters.

Despite large doses of diuretics and inotrope stimulation, after 5 days the signs of global cardiac decompensation as well as left sided pleural effusion persisted. The patient has not been febrile, leukocytes as well as CRP showed the trend of normalization. Transthoracic echocardiography was repeated; it showed mild aortic insufficiency with suspect small floating echo formation on the ventricular side of non-coronary cusp. Diagnostic was supplemented with transesophageal echocardiography, that showed rupture of non-coronary cusp, highly suspect vegetations on non-coronary and right cups, as well as severe aortic regurgitation. The whole picture suddenly got clearer; earlier diagnosed brain infarctions were shown to be the embolic complications of infective endocarditis.

The patient was prepared for an urgent surgical intervention; CT coronarography did not show any significant stenosis. Aantibiotic treatment was modified to match the protocol for infective endocarditis (addition of vankomycine). Preoperative blood cultures was positive on Enterococcus faecalis, and antibiotics were modified according to antibiogram. An urgent surgical aortic valve replacement with artificial two-leaved mechanic valve ATS No 24 was done. Postoperative rehabilitation was without any complications. Bacterial analyses of operative removed tissue confirmed diagnosis of Enterococcus foecalis caused infective endocarditis of aortic valve.

Three months after surgical intervention the first surgical control was performed; the patient has been without difficulties, moderately physically active and regularly taking prescribed medications.

Discussion

Despite modern antimicrobial treatment, infective endocarditis remains one of the deadliest infective diseases[8], which makes it's correct and early diagnosis and treatment both challenging, as well as the matter of the most importance. One of the first clinical presentations in our patient were neurological symptoms due to systemic embolism. Systemic embolism is found in almost third of patients with infective endocarditis and it dominantly affects central nervous system, which is showed in results published by Duk-Hyun Kang et al [9]. Typical laboratory finding include normocytic anemia [6], which was also presented in our patient. On the other hand, our patient presented himself with leukocytosis and neutrophilia, which is not that common[1,6,7]. Microorganisms that are more pathogen, such is Staphylococcus aureus, give more fulminant clinical picture[3,6,7], in comparison with our patient who has had more subacute form of disease, that is typical for other pathogens, like streptococci or enterococci. Enterococcus faecalis that was isolated in both blood cultures and from vegetation biopsies is the third most common cause of infective endocarditis, causing endocarditis in 8%-32% of cases [10]. The most of the patients that have suffered Enterococcus caused endocarditis are of older age and more likely to have congenital heart disease or cardiac device[10,11,12], unlike our patient. On the other hand, Enterococcus usually affects aortic valve[10], as well as in our case. The patients often have one or other form of immunosuppression[5,6,7]; our patient has suffered from poorly regulated diabetes mellitus. Echocardiography is gold standard for a correct diagnose. The initial technique of choice is transthoracic echocardiography, but transoesophageal echocardiography is often required in ambiguous situations[8]. We have repeated transthoracic echocardiography several times during hospitalization, when heart failure symptoms persisted despite intensive treatment. The most common and life-threatening complications of infective endocarditis are heart failure and systemic embolic events, both being present in our patient[7]. Yang et al[11] came to conclusion that embolic complications are more common in single valve endocarditis, as well as in case of affection of the mitral valve; the study did not show that a certain pathogen is more prone to embolic events[11]. When it comes to terms of treatment, antibiotics do play a crucial role in treatment, and are to be given according to guidelines and further antibiogram[4,7,8]. Indications for surgical treatment are progressive valve and tissue damage, uncontrolled infection, heart failure and high risk of

embolization[4,6,7,8], it's timing often being disputable. On one hand, later surgical intervention may allow a longer antibiotic therapy and hemodynamic stabilization[4], though most literature data imply that there is no reason in further delaying of surgical intervention once the diagnosis is set[4,6,7,12,13]. Infective endocarditis is rare but significant, as its diagnosis can be challenging, and the consequences of late or inadequate treatment severe and life threatening. The moral of the story might be to think of it in case of heart murmur, presence of risk factors or unexplained long lasting fever. The other important lesson is to perform adequate diagnostic, transthoracic echocardiography in first place, repeatedly if necessary.

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Sažetak

Nejasna srčana slabost i moždani udar

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Infektivni endokarditis je infekcija endokardijalne površine srca koja uglavnom zahvata srčane zaliske. Nepravnovremeno dijagnositkovana bolest dovodi do teških komplikacija, kao što su srčana slabost i smrtni ishod. Prikazali smo slučaj bolesnika koji je primljen sa višemesečnom istorijom simptoma srčane slabosti, intermitentne febrilnosti, jeze i drhtavice, kao i epizodom neuroloških simptoma. MRI endokranijuma je ukazivao na multiple regije moždane ishemije. Višestruko ponovljenim transtorakalnim ehokardiografskim pregledom uočena je suspektna vegetacija aortne valvule. Postavljena je dijagnoza endokarditisa sa posledičnim embolijskim manifestacijama centralnog nervnog sistema i srčanom slabošću. Bolesnik je lečen antibiotskom terapijom u skladu s preporukama iz važećeg vodiča i prema antibiogramu. Učinjena je kardiohirurška operacija zamene aortnog zaliska; kako neposredni, tako i kasniji postoperativni tok protiču bez komplikacija. Diferencijalna dijagnoza infektivnog endokarditisa se nameće kao ideja u slučaju dugotrajne, neobjašnjive febrilnosti, refrakterne na antibiotsku terapiju, kao i novonastalog šuma i prisustva rizikofaktora.

Ključne reči: levostrani endokarditis, aortna valvula, srčana slabost, embolijske komplikacije infektivnog endokarditisa