Complete heart block in young adult with acute rheumatic fever

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SUMMARY

Acute Rheumatic fever (ARF) is commonly associated with ECG abnormalities particularly atrioventricular block. However, third degree atrioventricular block or complete heart block is a rare manifestation. Most cases occurred in children. We reported a 25 year old man who developed complete heart block during an acute episode of ARF. He presented to hospital with five days history of fever, malaise and migrating arthralgia, followed by pleuritic chest pain. One day after admission his electrocardiogram (ECG) revealed complete heart block. Transthoracic echocardiography showed good left ventricular function with thickened, mild mitral regurgitation with minimal pericardial effusion. ASOT titer was positive with elevated white blood count and acute phase reactant. A temporary pacemaker was inserted in view of symptomatic bradycardia. The complete heart block resolved after medical therapy. He was successfully treated with penicillin, steroid and aspirin. He was discharged well with oral penicillin. The rarity of this presentation is highlighted.

INTRODUCTION

Acute Rheumatic fever (ARF) is still common and significant in Malaysia.[1,2] ARF is also commonly reported with feature of cardiac conduction system involvement as it is a part of Jones criteria for the diagnosis. However, complete heart block is a rare manifestation.[3,4,5] It is important to recognize this disease as the underdiagnosing of ARF may lead to recurrence of rheumatic fever, cardiomyopathy and premature death.

CASE PRESENTATION

We report a 25 year old male student with no underlying medical illness presented with five days history of high grade fever. It was associated with migrating arthralgia which started with the right shoulder and followed by the right knee. Subsequently, he developed pleuritic chest pain which worsened upon bending forward. Clinical examination showed temperature of 38.5°C, normotensive with a pulse rate of 107 beat per minute, respiratory rate of 26 per minute and saturation was 99% under room air. Cardiovascular examination revealed dual and normal heart sounds with no murmur, no pericardial rub and respiratory findings were normal. He was noted to have multiple impetigo lesions over bilateral upper and lower limbs. His joints pain was slightly improved with regular doses of oral paracetamol. Initial electrocardiogram (ECG) showed mild ST elevation with no obvious P wave. Meanwhile, chest x-ray showed mild cardiomegaly with clear lungs field. The white blood count was 12.5x10³µL with elevated CRP 159.5mg/L. Hemoglobin was 15g/dL and platelets count was 168x 10³µL. Renal and liver function were normal.

However, on day two, he complained of dizziness with ECG showing complete heart block with the lowest rate of 30/min. Transthoracic echocardiography (TTE) showed mild mitral regurgitation with minimal pericardial effusion. His CKMB was normal with level of 11 IU/L. ASO titer was positive 1:200 IU/ml.

He was diagnosed with ARF complicated by complete heart block. A temporary pacemaker via femoral vein was inserted in view of symptomatic severe bradycardia for two days. Subsequent ECGs showed improvement with lesser degree of atrioventricular heart block, mainly first degree heart block with heart rate of 70 to 90 per minute. He was treated with oral prednisolone for two days, IV penicillin 2.4 mega unit QID and oral aspirin 900 mg QID (50mg/kg/day) for 10 days. He was afebrile by day three of admission and the arthralgia had also resolved. He developed a mildly elevated liver transaminase secondary to high dose aspirin which resolved with dosage reduction. He was later discharged well with oral penicillin V 250mg BD as secondary rheumatic fever prophylaxis until the age of 40.

Upon follow up at one month, repeated ECG showed normal sinus rhythm with repeated TTE showed only trivial mitral regurgitation and no pericardial effusion. Repeated liver function test was normal. He was well at home with good effort tolerance and functional class.

DISCUSSION

Our patient fulfilled the Jones criteria for diagnosis of ARF with two major, two minor criteria and evidence of elevated ASOT titre. His TTE showed valvulitis with thickened mitral valve and mitral regurgitation. He also had pericarditis as shown by ECG changes and the presence of pericardial effusion. Later, he had complete atrioventricular block which was a rare presentation of ARF. This was also added with presence of polyathralgia with shoulder and knee joint involvement. The minor criteria were fever and high CRP level. These clinical presentation and investigation were consistent with ARF.

This article was accepted: 9 November 2017
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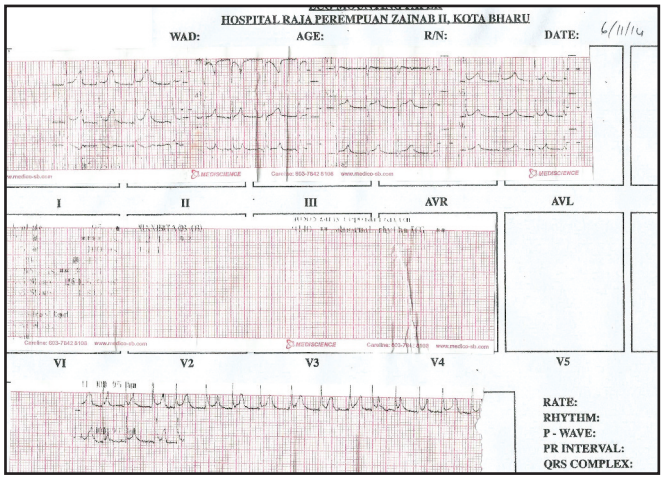

Fig. 1: Initial ECG showed mild ST elevation with no P wave suggestive of early pericarditis.

Table I: Vital sign monitoring chart showing sudden episode of bradycardia.

Patient's Name: RN:
Age:
Ward:

DATE	TIME	BP	PULSE	RESP RATE	TEMP	PAIN SCORE
6/11	12am	116/70	99	20	37°c	0/10
	4am	105/72	94	22	37°c	0/10
	8am	118/67	96/min	24/min	37°c	0/10
	11.55am	140/90	88/min	22/min	37°c	0/10
	2.40pm	139/81	98/min	22/min	38°c	1/10
	7.30pm	126/76	100	22	39°c	1/10
	11pm	130/80	106	20	39	1/10
7/11	4.10pm	120/80	100	20	39	1/10
	8am	132/90	96	22	38.9	1/10
	12N	140/70	60	24	37.5	1/10
	4pm	134/66	43	24	38.3	1/10
	7.35pm	131/64	47	24	37.5	1/10
8/11	12am	140/70	48	22	37.8	1/10
	4.30am	130/64	50	22	37.5	1/10
	8am	128/60 mmHg	49/min	22/min	38°c	1/10
	11.6am	130/64 mmHg	41/min	22/min	37.5°c	1/10
	WAD	CRW				
	11.8am	124/62	38	87		
	12.30pm	101/87	54	30	37°C	0/10
	1.30pm	144/61	43			
	2.30pm	125/58	40	31		
	3.30pm	134/61	40	23		
	4.00pm	137/59	54	30		
	4.30pm	121/53	48	26	37°c	0/10
	5.30pm	128/60	48	24		

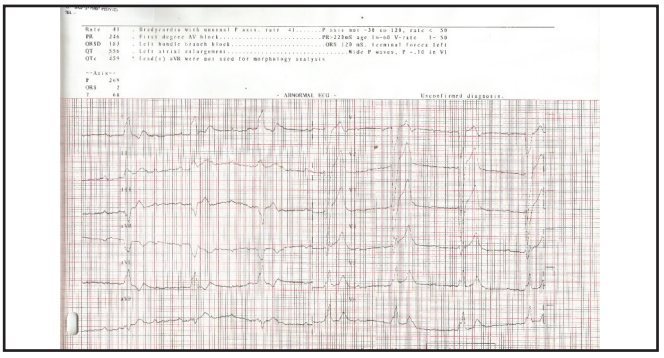

Fig. 2: ECG showing complete heart block.

ARF is mainly disease of children aged 5 to 14 years and the range of age affected in Malaysia can be from 1 to 35 years old.[1] Despite the rarity of its occurrence in adults, misdiagnosis may carry sequelae of Chronic Rheumatic Heart Disease (CRHD) which leads to valvular damage. The recurrence rate is the highest during the first year following the first ARF episode and decreased to zero by ten years after the first episode.[1], This is the rationale of continuing antibiotic prophylaxis until age 40 years, in order to prevent recurrent episodes.

ARF is commonly caused by upper airway infection by Group A streptococcus.[3] However, instead of acute pharyngitis, our patient presented with recurrent episodes of skin infections as he had been living in a hostel where hygiene was an issue. The episode of streptococcal skin infection and ARF has been reported before where increasing evidence of skin associated Streptoccoccal pyogenes infection causing ARF.[3] Therefore treatment was immediately initiated as universally recommended.

ARF is commonly associated with ECG abnormalities particularly first degree atrioventricular block. A study done in Australia found that carditis was present in 27.5% of ARF cases. In 25 case reports of atrioventricular block in the setting of ARF analyzed by Omar et al, only five of which were adult cases.[4] Even though, a higher degree of atrioventricular block is uncommon, there were cases reported in developing countries like Korea and Bahrain.[3]

It has been shown that even with the advance degree of heart block, this is a reversible condition which can be successfully treated with high dose aspirin, penicillin and short course of steroid for pericarditis with effusion.[3] Most observations point to the absence of correlation between carditis and the severity of ECG.

A few studies had correlated the AV block and the degree of carditis, they found that the pathophysiology was poorly understood, and it was thought due to the involvement of pancarditis. Furthermore, its presence did not correlate with the outcome of ARF.[3] Our patient required insertion of a temporary pacemaker in view of symptomatic bradycardia which was removed as his condition improved.

CONCLUSION

We conclude that the diagnosis of ARF relies on health professionals being aware of the diagnostic features. Patient may also develop complete heart block which is an unusual presentation for the diagnosis of ARF. This should be considered even in adults when they fulfilled the Jones criteria. However, complete heart block appears to be a temporary event, resolves with conventional medical therapy and has no relationship with the prognosis.

REFERENCES

1. Ibrahim, A. and A. Rahman, Rheumatic heart disease: how big is the problem? Medical Journal of Malaysia, 1995. 50: p. 121-1.
2. Hung, L.C. and R. Nadia, A Review of Acute Rheumatic Fever and Rheumatic Heart Disease Research in Malaysia. Med J Malaysia, 2016. 71(Suppl 1): p. 79-86.
3. Yoo, G.-H., Complete atrioventricular block in an adolescent with rheumatic fever. Korean circulation journal, 2009. 39(3): p. 121-3.
4. Ghani, O.A.A. and D. Singh, Acute Rheumatic Carditis: A Rare Cause for Reversible Complete Heart Block. Hawai'i Journal of Medicine & Public Health, 2015. 74(10): p. 341.
5. Lawrence, J.G., et al., Acute rheumatic fever and rheumatic heart disease: incidence and progression in the Northern Territory of Australia 1997-2010. Circulation, 2013: p. 113.