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Case Report

Early-Onset Statin-Induced Immune-Mediated Necrotising Myositis: A Rare Case Report from a Resource-Constrained Setting

Mohommed Risly[1]*, Kumudini Jayasinghe[1], Nilanthi Athauda[1], Vishwa Wijekoon[1], Sasijani Abhayarathne[1], Sahana Jawfer[2]

[1]National Hospital, Kandy, Sri Lanka.
[2]Teaching Hospital, Peradeniya, Sri Lanka.

Abstract

Background: Statin-induced necrotising autoimmune myositis (SINAM) is a rare but serious complication of statin therapy characterized by progressive proximal muscle weakness, markedly elevated creatine kinase (CPK) levels, and anti-HMG-CoA reductase (anti-HMGCR) antibodies.

Case Presentation: We report a case of a 40-year-old Sri Lankan female with type 2 diabetes and non-alcoholic fatty liver disease who developed severe myalgia and proximal muscle weakness three months after starting rosuvastatin. Laboratory evaluation revealed a CPK level of 92,000 U/L, AST/ALT ratio favouring muscle origin, transient creatinine elevation, and nephrotic-range proteinuria (with myoglobinuria). Electromyography showed features of active myopathy, and muscle biopsy confirmed necrotising myositis. Extensive autoimmune and infectious workups were negative, and anti-HMGCR antibody testing was unavailable locally. Despite this limitation, the diagnosis of SINAM was made by exclusion of other etiologies and supported by histological and clinical findings. The patient showed dramatic improvement with high-dose corticosteroids alone, without the need for additional immunosuppressants. Relapse upon steroid tapering further supported an autoimmune aetiology.

Discussion: Unlike most SINAM cases, which present years after statin initiation, this case highlights an unusually early onset. It underscores the diagnostic challenge in resource-limited settings lacking anti-HMGCR testing. Additionally, the case demonstrated an atypical renal manifestation of overflow proteinuria without albuminuria, likely due to massive myoglobinuria. Timely discontinuation of the statin and initiation of steroids resulted in full recovery, avoiding long-term complications.

Conclusion: Clinicians should maintain a high index of suspicion for SINAM in patients on statins who present with progressive myopathy and elevated CPK, even in the absence of confirmatory serology. Early diagnosis and corticosteroid therapy can lead to excellent outcomes.

Keywords: Anti-HMGCR antibodies, Autoimmune myopathy, Myositis, Proximal myopathy, Rhabdomyolysis, Statin-associated autoimmune necrotising myositis

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***Corresponding author:** Email: risly526@gmail.com https://orcid.org/0009-0000-4743-5034

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Introduction

Statin-Induced necrotising autoimmune myositis (SINAM) is a rare but severe condition characterised by rapid-onset proximal muscle weakness and significantly elevated creatine kinase (CPK) levels, often exceeding 1000 U/L. The pathophysiology involves an autoimmune response triggered by statin therapy, leading to muscle fibre necrosis with minimal inflammatory infiltrate. Diagnosis typically requires detection of anti-HMG-CoA reductase antibodies and confirmation by muscle biopsy [1,2,3]. From a Sri Lankan perspective, only one similar case has been reported with a mild-to-moderate degree of myositis [4]. Our case is unique due to the early onset of SINAM and the unusual presence of overt proteinuria, posing a diagnostic challenge in a resource-poor setting.

Case presentation

A 40-year-old lady with Type 2 diabetes (for 4 months), dyslipidaemia, grade 1 non-alcoholic fatty liver disease (NAFLD) (Fib-4 score 2.66), presented with worsening myalgia over one day. She was on rosuvastatin 10 mg once a day for the last 3 months. There was no associated arthralgia, fever, rash, limb or facial weakness. She reported tea-colored urine in the morning but denied frothy urine, hematuria, lower urinary tract symptoms, loin pain, pale stools, pruritus, or right hypochondriac pain. The myalgia had been progressively worsening over three days and was most intense on the day of admission. She denied recent trauma, dietary changes, including grapefruit juice intake, new medications, or any recent infections. There were no symptoms suggestive of connective tissue disorders such as Raynaud's phenomenon, photosensitive rash, alopecia, constitutional symptoms, or features of thyroid dysfunction except for long-standing menorrhagia. There was no history of alcohol or illicit drug use. Her past medical history before the diagnosis of diabetes was unremarkable, with no chronic illnesses, no history of childhood jaundice or fever, and no notable complications related to diabetes. On examination, she was afebrile, non-icteric, and not pale. There was marked tenderness over the bilateral arms, forearms, thighs, and calves, without redness, arthritis, or skin changes. Cardiovascular, respiratory, and abdominal examinations were unremarkable. Neurologically, she had proximal more than distal muscle weakness with a power of 4/5 and preserved reflexes, and no other focal neurological deficits.

Investigations [Table 1] revealed a complex picture with evidence of systemic inflammation, severe muscle injury, hepatic transaminitis, and transient renal impairment. Her complete blood count showed persistent microcytic hypochromic anaemia (haemoglobin 10.1 g/dL, MCV 68 fL), thrombocytosis (platelets 417 x10⁹/L), and a mildly raised leukocyte count with neutrophilia, all suggestive of an inflammatory state and iron deficiency, which was confirmed by low ferritin (50 ng/mL) and peripheral smear. Liver enzymes were markedly elevated, with AST peaking at 1635 U/L and ALT at 701 U/L, but the AST:ALT ratio and the dramatic increases in CPK (up to 92,000 U/L) and LDH (up to 2125 U/L) strongly pointed to muscle-origin injury rather than primary hepatic pathology. Total bilirubin was raised (up to 5.87 mg/dL), predominantly indirect, but there were no features of hemolysis in the blood picture. Serum albumin declined slightly (from 4.1 to 3.78 g/dL), possibly due to an acute-phase reaction. Renal function was preserved mainly, although serum creatinine transiently rose from 47 to 95 µmol/L, likely secondary to early rhabdomyolysis that was prevented. Urine studies showed nephrotic-range proteinuria (U.PCR 2526 mg/g), with a normal albumin-to-creatinine ratio and bland sediment, suggesting tubular protein loss or a false-positive result due to myoglobinuria (urine dipstick was positive for myoglobin). No hematuria or pyuria was noted. Inflammatory markers showed mildly elevated CRP (3.1-5.7 mg/L) and an initial moderately raised ESR (65 mm/hr), which declined (to 25 mm/hr) with treatment. Thyroid function tests were normal, and fasting glucose was mildly elevated.

Electromyography revealed features of active myopathy—low amplitude, short-duration polyphasic units with early recruitment. Muscle biopsy (Figure 1) performed early showed features of necrotising myositis, including necrotic fibres, neutrophilic and eosinophilic infiltration, and no vasculitis. A repeat biopsy post-treatment showed resolving myositis with regenerating fibres, myophagocytosis, and sparse CD8+ T cells without sarcolemmal MHC expression, indicative of a steroid response. Myositis-specific antibodies (anti-Mi-2, TIF-1γ, SRP, Jo-1) and ANA were negative, as were viral screens (HBV, HCV, EBV, CMV), suggesting seronegative necrotising autoimmune myopathy. Anti-HMG-CoA reductase antibody, which would be relevant in the setting of statin exposure, was not available locally. Other tests, including abdominal ultrasound (showing grade I fatty liver), ECG, retinopathy screening, and faecal occult blood testing, were unremarkable.

In conclusion, the clinical and biochemical findings supported a diagnosis of statin-associated immune-mediated necrotising myopathy, complicated by systemic involvement including iron deficiency anaemia (likely related to menorrhagia due to adenomyosis), mild hepatic and renal dysfunction, and good steroid responsiveness. Following steroid tapering off, there was biochemical worsening and recurrence of symptoms, which resolved with high-dose steroid re-initiation. Despite the absence of anti-HMG-CoA reductase antibodies, based on the clinical picture and exclusion of other causes, a final diagnosis of statin-induced necrotising autoimmune myositis was made. In the follow-up, the patient was asymptomatic with high dose steroids and followed up with a plan of gradual tapering of steroids.

Table 1: Laboratory investigation findings

Investigation	Normal range	Baseline (Pre-hospital)	After admission	Before steroid initiation	Before discharge
WBC	4.0–11.0 x10⁹/L	5.3	7.66	8.31	7.3
Neutrophils	2.0–7.5 x10⁹/L	3.4	5.94	6.7	5.6
Lymphocytes	1.0–3.0 x10⁹/L	1.2	1.31	2.0	
Monocytes	0.2–1.0 x10⁹/L		0.27		
Eosinophils	0.0–0.5 x10⁹/L		0.12		
Hb	13.0–17.0 g/dL (M)	10.3	10.1	10.2	10.0
HCT	40–50%	32	34		
MCV	80–100 fL		68		
MCH	27–32 pg		20.1		
MCHC	32–36 g/dL		29.6		
RDW-CV	11.5–14.5%		16.6		
Platelet	150–450 x10⁹/L	211	417		
AST	<40 U/L	121	1635	1627	427
ALT	<41 U/L	110	618	701	140
Total Bilirubin	0.2–1.2 mg/dL	1.0	5.87		
Direct Bilirubin	<0.4 mg/dL	0.4	1.1		
Indirect Bilirubin	0.2–0.8 mg/dL	0.6	4.77		
Total Protein	6.0–8.0 g/dL	7.7	6.2		
Albumin	3.5–5.0 g/dL	4.1	3.78		
Globulin	2.0–3.5 g/dL	3.6	2.2		
ALP	40–129 U/L	66	72.5		
Gamma GT	9–48 U/L	64	33.6		
PT/INR	0.8–1.2		0.9		
APTT	25–35 sec		31		
Blood Urea	2.5–6.4 mmol/L		4.45		
S. Creatinine	60–110 µmol/L		65	87	95
Na+	135–145 mmol/L		135		
K+	3.5–5.1 mmol/L		4.2		
PO_4^{3-}	0.8–1.5 mmol/L		0.9		
Ca^{2+}	2.1–2.6 mmol/L		2.3		
CRP	<5 mg/L		3.1	5.7	11.1
ESR	0–20 mm/hr		65		25
LDH	140–280 U/L		2125		2000
CPK	30–200 U/L		92000	78000	15871
FBS	70–100 mg/dL	121	110		
Total Cholesterol	<200 mg/dL	256			
HDL	>40 mg/dL	49			

LDL	<100 mg/dL	171		
Triglycerides	<150 mg/dL	190		
UFR - Protein	Negative		++	
UFR - Pus Cells	Nil		Nil	
UFR - Red Cells	Nil		Nil	
Urine dipstick myoglobinurea			Positive	Negative
U. PCR	<350 mg/g		2526	650
Urine Albumin	Negative		Nil	
Urine ACR	<30 mg/g		<30	
TSH	0.4–4.0 mIU/L		3.592	
fT4	9–20 pmol/L		15	
Retic Count	0.5–2.5%		Normal	
Serum Ferritin	24–336 ng/mL		50	

Antibody Panel	
Myositis Antibody Panel	Signal intensity Result 0-5 Negative 6-10 Borderline 11-50 Marginally Positive **> 50 Strongly Positive**
Mi-2 alpha(Mi-2a) Antibody	Borderline (9)
Mi-28 Antibody	Negative (2)
TIFigamma (TIFig) Antibody	Negative (0)
MADS Antibody	Negative (2)
NNXP2 Antibody	Negative (3)
SAE1 Antibody	Negative (1)
Ku Antibody	Negative (3)
PM-Scl100 Antibody	Negative (0)
PM-Scl75 Antibody	Negative (11)
Jo-1 Antibody	Negative (2)
SRP Antibody	Negative (7)
PL-7 Antibody	Negative (3)
PL-12 Antibody	Negative (3)
EJ Antibody	Negative (2)
QJ Antibody	Negative (2)
Ro-52 Antibody	Negative (1)

Biopsy & immunohistochemistry	
Muscle biopsy	Biopsy shows muscle tissue with multiple foci of muscle-bundle necrosis and a minimal infiltrate of neutrophils, admixed with eosinophils and some lymphocytes. Some inflammatory cell infiltrate is also noted in between the muscle bundles. Many degenerating muscle fibres with marked profuse myophagocytosis are present. The interstitial blood vessels are free of vasculitis or vascular thrombosis. A few muscle fibres show mild cytoplasmic eosinophilia consistent with extensive muscle degeneration. *Comment:* The appearances are those of autoimmune necrotising myositis.
Immunohistochemistry of muscle Biopsy (performed after 2 weeks of steroids)	Sections show skeletal muscle fibres with multifocal myophagonecrosis. Basophilic regenerating fibres are seen. Perivascular inflammation is not seen. Immunostains for MHC did not reveal sarcolemmal labelling. Scattered positivity for CD8 lymphocytes is noted in the endomysium. CD4 and CD20 are negative. As such, appearances are more in favour of resolving myositis.

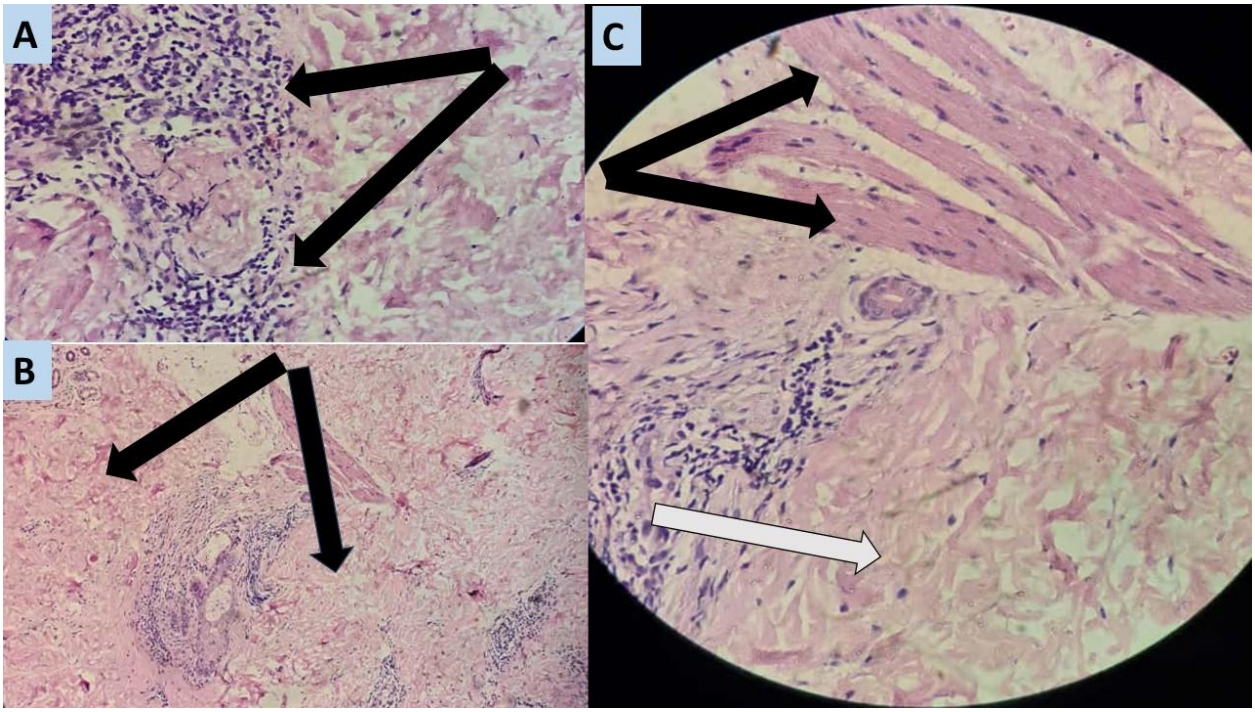

Figure 1: Histological images of muscle biopsy. Image A: Black arrows show inflammatory infiltrate between muscle fibres. Image B: Black arrows show inflammation with pink, eosinophilic infiltrate. Image C: Black arrows show myocyte necrosis (swollen, shrunken, condensed and pyknotic muscle fibres) and the white arrow shows profuse muscle degeneration with cytoplasmic eosinophilia.

Discussion

This case highlights an immune-mediated necrotising myositis induced by statin use, diagnosed following meticulous evaluation in the absence of anti-HMG-CoA reductase antibodies, as they are unavailable in Sri Lanka. We discuss the challenges encountered in diagnosis and management that stopped disease progression.

Statins are commonly used and highly recommended medications for the primary and secondary prevention of cardiovascular disease, with an excellent safety profile [5]. But rarely does it lead to adverse effects such as SINAM, as in our case.

In SINAM, patients often present with progressive muscle weakness, particularly in proximal muscles, and may experience associated oedema without pain [1]. Markedly elevated CPK levels are a hallmark, with values sometimes reaching 28,000 U/L [6]. The condition is linked to the production of autoantibodies against HMG-CoA reductase, which plays a crucial role in cholesterol synthesis. Muscle biopsies reveal myofiber necrosis, distinguishing it from other myopathies [6].

Different cohorts have reported a mean interval of three years between the initiation of statin therapy and the onset of SINAM symptoms. However, this duration of onset can vary, ranging from two months to 14 years [7].

But when a young woman presents with myalgia with proximal muscle involvement, it's prudent to exclude the common causes like dermatomyositis, polymyositis, inclusion body myositis, and other types of immune mediated myositis before attributing it to statins [8]. Currently, two myositis-specific autoantibodies are recognised in association with immune-mediated necrotising myopathy (IMNM): anti-signal recognition particle (anti-SRP) and anti-HMG-CoA reductase. The latter has been linked to statins, which are primary inhibitors of HMGCR, though a definitive causal relationship has not been established in the literature [9].

In our case, the unavailability of Anti-HMG-CoA reductase antibodies was a limitation, which was overcome by a diagnosis of exclusion based on other available investigations, including an extensive antibody panel, biopsy, and EMG. Our antibody panel showed borderline positivity for Anti-Mi-2 alpha, Anti-PM-Scl75, and Anti-SRNP antibodies, which were considered clinically insignificant because they can be present in the normal population and could lead to false positivity.

In the published literature, aside from anti-HMGCR-positive cases, in which the majority were diagnosed

with myositis, many individuals with myositis antibodies do not have a myositis diagnosis. Most patients with these antibodies, however, have myositis, interstitial lung disease [ILD], or connective tissue disease, highlighting the diverse conditions associated with myositis antibodies. Malignancies and ILD were also relatively common in those with myositis antibodies, beyond the well-known associations. Higher antibody band intensity and the presence of multiple myositis antibodies may enhance the positive predictive value for specific myositis antibodies [9,10]. Clinical diagnosis relies on many features rather than merely depending on antibody panels.

Another interesting finding noted in our case was the presence of overt proteinuria in the absence of albuminuria, nephrotic syndrome and diabetic retinopathy. It can be explained by the excessive myoglobin excreted in urine, which was positive for protein. Also, the AST rise, along with very high ALT, could indicate a component of hepatitis due to statins.

The presence of overflow proteinuria in severe necrotising myositis, despite the absence of glomerular pathology, can be attributed to muscle-related mechanisms rather than renal dysfunction. This phenomenon is particularly seen in conditions such as polymyositis, where muscle damage leads to the release of myoglobin, creatine kinase, and other proteins into the bloodstream, subsequently resulting in proteinuria [11]. It can also be explained by acute tubular necrosis, IgA nephropathy, and membranous nephropathy associated with myoglobinuria, which is less likely in our case, given normal creatinine levels, absence of hematuria, and severe rhabdomyolysis [12]. A renal biopsy should confirm the diagnosis, but it was not performed because proteinuria had resolved and potassium and creatinine were stable.

Treatment of SINAM often involves high-dose glucocorticoids, intravenous immunoglobulin (IVIG), and other immunosuppressants, with variable responses [1,2,7]. Fortunately, our patient responded to high dose corticosteroids. For dyslipidemia, the patient was started on ezetimibe with lipid monitoring.

Conclusion

Though SINAM is rare, it is crucial to maintain a high degree of suspicion, with prompt discontinuation of the culprit drug when patients present with similar symptoms to avoid complications.

Consent

Informed consent was obtained from the patient for the publication of this case report and any accompanying images. All ethical considerations were adhered to in accordance with institutional guidelines. No personal data has been displayed; all information was de-identified.

Author contributions

Conceptualisation: NMMR, Case management: NMMR, NA, IKJ, KADW Manuscript drafting: NMMR, JFS Critical review and final approval: NA, IJK

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References

1. Patel H, Vaysblat M, Bae S, Flescher A, Federbush M. Statin induced necrotising autoimmune myositis [abstract]. Circulation. 2023;148(Suppl 1):17245. doi:10.1161/circ.148.suppl_1.17245.

2. Sharma A, Musurakis C, Nabil N, Poudel B, Trongtorsak A. A case series of statin-induced necrotising autoimmune myopathy. Cureus. 2022;14(2):e21613. doi:10.7759/cureus.21613.

3. Jasim M, Sapkota HR, Timmons M, Manfredonia F, Pohl U, Barkham N. Statin-induced autoimmune necrotising myositis - a single-center case series highlighting this potentially life-threatening but treatable condition. Clin Case Rep. 2020;8(12):3373-7. doi:10.1002/ccr3.3350.

4. Chamara R, Jayasinghe K. Statin-induced autoimmune necrotising myopathy: a case report. Anuradhapura Med J. 2022;16(1):18-20. doi:10.4038/amj.v16i1.7699.

5. US Preventive Services Task Force, Mangione CM, Barry MJ, Nicholson WK, Cabana M, Chelmow D, et al. Statin use for the primary prevention of cardiovascular disease in adults: US Preventive Services Task Force recommendation statement. JAMA. 2022;328(8):746-53. doi:10.1001/jama.2022.13044.

6. Fung BM, Heinze ER, Wong AL. Statin-associated necrotizing autoimmune myositis complicated by an uncommon adverse effect to treatment. Case Rep Med 2019;2019:4601304.

7. Paracana B, Amado C, Krowicki J, Monteiro S, Sousa MS. Statin-induced necrotising autoimmune myopathy: an uncommon yet challenging complication of statin use. Cureus. 2024;16(10):e71311. doi:10.7759/cureus.71311.

8. Ratnarajah A, Barber B, Samarasinghe Y, Lloyd M. A young woman with myalgia. Clin Med (Lond). 2014;14(5):525-7. doi:10.7861/clinmedicine.14-5-525.

9. Szczesny P, Barsotti S, Nennesmo I, Danielsson O, Dastmalchi M. Screening for anti-HMGCR antibodies in a large single myositis center reveals infrequent exposure to statins and diversiform presentation of the disease. Front Immunol. 2022;13:866701. doi:10.3389/fimmu.2022.866701.

10. Kerola AM, Pietikäinen A, Barantseva J, et al. Predictive value of myositis antibodies: role of semiquantitative classification and positivity for more than one autoantibody. RMD Open. 2025;11(1):e005007. doi:10.1136/rmdopen-2024-005007.

11. Kim H, Kim JY, Kim SJ, Park ES, Shin SJ, Kang KY, et al. Overflow proteinuria as a manifestation of unrecognised polymyositis. Int Med Case Rep J. 2014;7:71-4. doi:10.2147/IMCRJ.S60885.

12. Yen TH, Lai PC, Chen CC, Hsueh S, Huang JY. Renal involvement in patients with polymyositis and dermatomyositis. Int J Clin Pract. 2004;59(2):188-93. doi:10.1111/j.1742-1241.2004.00248.x.