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Case Report

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NEUROMYELITIS OPTICA IN PREGNANCY: A RARE CASE REPORT

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ABSTRACT

Neuromyelitis optica (NMO) a neuroinflammatory autoimmune disease causing destruction of the Central Nervous System, Here a 31 year old female patient visited SSG OPD with pain in the left upper back and shoulder along with lower extremities weakness. The patient was 17 weeks pregnant. Temperature, blood pressure, pulse rate was normal. General condition was fair. Later on many blood tests were carried out to check for auto immunity including ANA titer, Anti SSA; everything came positive. Suspicion arose over NMO, Anmo ab titer test was done; the test came positive. Hence the diagnosis of NMO. Biggest challenge included that the patient was pregnant and many drugs would have been contraindicated in such case. Too much caution was advised. The disease was treated with Plasma exchange therapy, steroids followed by CNS pain relievers. The patient was stable at the time of discharge but there was a high chance of recurrence.

KEYWORDS: Neuromyelitis optica, Pregnancy, Devic's disease.

1. INTRODUCTION

Neuromyelitis optica also known as Devic's disease, is a neuroinflammatory autoimmune disease causing destruction of the Central Nervous System (CNS). The immune system recognizes the aquaporin-4 (AQP4) water channel as foreign and develops antibodies (NMO-IgG or anti-AQP4 antibody) to attack AQP4 on the surface of astrocytes, which in turn damages the astrocytes. Here AQP4 channels are aquaporin channels responsible for the conduction of an impulse through water based protein channels.[1] Location of these channels dominate in the spinal cord region. Astrocytes are supportive cells in the brain, spinal cord and optic nerves, and damage to astrocytes is believed to lead to demyelination. Clinical presentation may include recurrent longitudinal extensive transverse myelitis (LETM), which is abnormal T2 signal traversing at least three vertebral body segments in length and/or optic neuritis. Everything from reflex arc to cognitive thinking may be affected, severity may differ.[2] Other than AQP4, MOG antibodies are also to be found in the blood stream which may constitute towards the negative AQP4 channels based NMO. These patients will be severe and in immediate need of treatment.[3,4]

Distinguishing fact between transient myelitis, multiple sclerosis and NMO lies in the system that is attacked by the humoral immunity. Humoral immunity can be cleared by plasmapheresis, serving for acute attacks.[5,6] NMO attacks are the most recurrent attacks as compared to other spinal auto immune attacks. Basicaly the optic nerve is damaged by our own immune cells which in turn alters vision along with subsequent attacks in muscular coordination.[6] NMO AND PREGNANCY: Less than a hundred cases of pregnancies in women with neuromyelitis optica (NMO) have been published in the world. NMO clinical presentation during pregnancy is associated with higher risk of miscarriage and preeclampsia. Patients with NMO show increased relapse rates peripartum with significantly increased rates postpartum.[7] It is possible the increased level of progesterone and estrogen during pregnancy may be related to a shift from Th1 to Th2 mediated immune response exacerbating the course of NMO.[8] The relapse rate of demyelinating events in the first trimester after pregnancy was significantly higher than at any other time. During pregnancy if a spinal or neural attack arises there are very few options available for the treatment. Since the foetus is also to be taken care of. Many immunosuppressant drugs may be given while they may not directly harm the baby but toxicity & infections may arise.[9]

2. CASE PRESENTATION

A 31 year old 17 weeks pregnant lady started having sudden onset of pain in her left upper back and shoulder. The next morning when she got out of bed, she noticed left lower extremity (LLE) weakness which worsened over the next few days and she was unable to move. Two days after onset of symptoms, she assigned to different hospital and a CT head and lumbar puncture were normal and was discharged home. Two weeks after symptom began, she was admitted with worsening weakness of the LLE and numbness of the right lower extremity (RLE). During her hospital stay, she had five days of IV steroids and reported mild improvement in motor function of lower extremities; however, still reported weakness and numbness. Patient was then admitted to another hospital, about 3 weeks after symptoms first began. She reported tightness in the left upper back radiating down the lateral chest, numbness and tingling in the right leg and weakness in the LLE. Patient was able to urinate without difficulty, but reported constipation. No complaints of fever or chills, no changes in vision or blurry vision.

A. VITALS

Temperature	Pulse rate	Blood pressure	SPO2
Normal	82	120/80mm of hg	98%

PHYSICAL EXAMINATION
CNS EXAMINATION

Part of the limb	Elbow Flexors	Wrist Extensors	Elbow Extensors	Finger Flexors	Finger abductors
Right	5/5	5/5	5/5	5/5	5/5
Left	5/5	5/5	5/5	5/5	5/5
	Hip Flexors	**Knee extensors**	**Ankle Dorsi Flexors**	**EHL**	**Ankle**
Right	5/5	5/5	4/5	5/5	5/5
Left	1/5	3/5	0/5	0/5	0/5

General condition: Fair
CVS: S1 & S2 normal, no murmurs
Abd: gravid, soft, non-tender, non-distended, no palpable masses, bowel sounds present
GU: no suprapubic tenderness
Rectal: Deep anal pressure and voluntary anal contraction
Ext: no edema, calf tenderness
MSK: Full Passive ROM UEs and LEs. Full Active ROM for UEs only
Neuro: AAOx3, CN II-XII intact, no nystagmus or diplopia
Tone: Normal
Sensation: **Impaired to LT in LLE and to pinprick in Right leg extremity**
Reflexes: **1+ in b/l UEs and 3+ b/l LE, 2 beats of clonus on Left ankle, positive Babinski's on Right, neg Hoffman's b/l**
Coordination: (Finger to Nose testing) FTN w nl b/l
Gait: Patient unable to stand or walk independently, in wheelchair

B. FAMILY HISTORY AND HISTORY OF PRESENT ILLNESS

Past Medical History: Miscarriage 1 year ago
Past Medication History: Prenatal vitamins and painkiller
Family History: None, no hx of autoimmune or muscle diseases
Social History: Labourer, Lives with husband in an apartment. No recent travel.
Pregnancy status: $G_2P_2A_1L_1$

C. LABORATORY INVESTIGATION

Table 1: Laboratory findings.

Parameters	Obtained value	Normal range	Interference
Hemoglobin	13.7g/dl	12-17.5 g/dl	Anemia
RBCs	3.61mill/cumm	4.2-6.1 mill/cumm	Vitamin B6, B12 or folate deficiency
WBCs	9000 Cells/cumm	5000-13000cells/cumm	Normal
Total Bilirubin	0.80mg/dl	0.2-1.2mg/dl	Normal
Direct Bilirubin	0.30mg/dl	0.1-0.4mg/dl	Normal
Indirect Bilirubin	0.50mg/dl	0.2-0.8mg/dl	Normal
Total Protein	7.60g/dl	6-8g/dl	Normal
Serum Albumin	4.10g/dl	3.5-5.5g/dl	Normal
Serum Globulin	3.50g/dl	2.3-3.6g/dl	Normal
Albumin/globulin ratio	1.17	1-2	Normal

Sodium	133mEq/l	135-145mEq/l	Low
Potassium	4.4 mEq/l	3.5-5mEq/l	Normal
Urea	19mg/dl	7-20mg/dl	Dehydration/Kidney damage
Creatinine	0.65mg/dl	0.5-1.2mg/dl	Normal

D. DIAGNOSTIC TESTS

- ANA titer: **1:640** ANA pattern: speckled
- Anti-SSA Ab**: >8**
- NMO Ab titer**: postitive**
- Anti- SSB Ab: **0.2**
- Rheumatoid Factor: **44.9**
- Scleroderma Ab : **<0.2**
- C3 : 118 (80-160mg/dl), C4: **25** (20-40 mg/dl), dsDNA <12
- HIV 1 & 2 : **Non reactive**
- Hep B : NR, Hep C : **NR**
- HSV 1 IgG Ab: pos **21.3**
- HSV2 IGG Ab: **neg 0.15**
- AQP4 IgG test - **+ve**

Other Tests

- HbA1C : **5.1 %**
- TSH : **0.63**
- CSF Cx few to mod WBC, no orgs seen
- CSF protein 46, no oligoclonal bands

E. IMAGING

MRI of the cervical spine shows abnormal intrinsic cord signal occupying nearly the entire cross-sectional area of the cord extending from C6-C7 through T5-T6 with mild expansion of the cord at those levels.

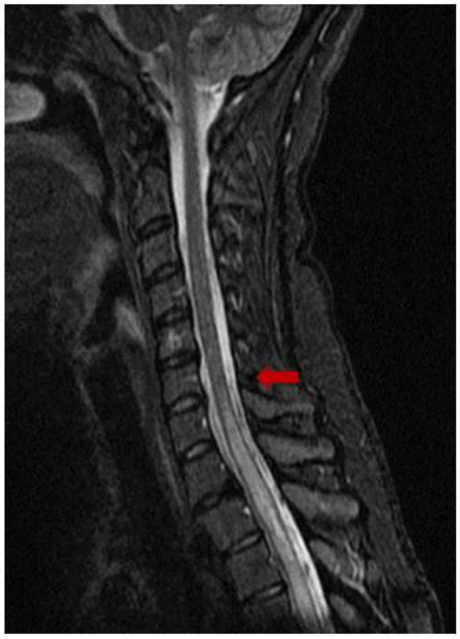

Fig. 1: MRI of cervical spine.

F. FINAL DIAGNOSIS

Neuromyelitis optica in a pregnant woman.

G. TREATMENT

Patient was started on plasma exchange (PLEX) therapy and IV steroids. On going treatment included monthly PLEX treatment and oral steroids until delivery and plan for Rituximab infusions postpartum to prevent future attacks.

NAME	ROUTE	DOSE	FREQUENCY	DURATION
PLASMA EXCHANGE (PLEX)	IV	5(1/DAY)	OD	5 Days
T. GABAPENTIN	PO	1200 mg	OD	5 days
INJ. METHYLPREDNISOLONE	IV	1g	OD	5 days
INJ. PCM	IV	500mg	8 hrly	2days
T. HEMATINICS	PO		BD	
INJ. RL	IV	4 pint	slowly over 24 hr	2 days
T. MVBC	PO		BD	
T. PCM	PO	500mg	SOS	

T. PREDNISOLONE 1mg/kg x month oral and then tapering the dose.

ObGyn physician was consulted to ensure all new medications did not affect the pregnancy and monitored weekly fetal ECHO.

H. Discharge Summary

Currently on

DRUG NAME	DOSE	FREQUENCY
Prednisone	25mg	qD
PCM + Diclo + Chlorzoxaxone	500mg + 50mg + 500mg	BD
Carbamazepine	200mg	qD
Rabeperazole + Domperidone	20mg + 30mg	BD
Atovaquone	750mg/5ml	qD

Plan for stress dose steroids in labor
Plans to start Rituxan(Rituximab) post delivery
Anesthesia consult 10/18: no contraindications to labor/spinal/epidural.

I. Follow Up

The patient delivered a healthy baby boy. She has been following up last visit about a month ago showed 5/5 strength in LEs, but presented with new onset gait instability (independent prior), concern for relapse.

3. DISCUSSION

Neuromyelitis Optica is a rare auto-immune disorder that attacks the optic nerve and the spinal cord. There may or may not be presence of spinal attacks leading to tingling, numbness and difficulty in movement during the walking phase. Main issue while diagnosing NMO was differentiating it from multiple sclerosis, MRI confirmed NMO.[7] Motor function of lower extremities; however, still reported weakness and numbness. Majority of auto immune disorder responds well to plasma exchange therapy (PLEX) including NMO, was used to treat the patient.[8] Suitable references from several studies were found where the progression was in context with Multiple Sclerosis, Acute Disseminated Encephalomyelitis and Systemic lupus Erythematosus were found as co-existent diseases.[10] In our case the distinguishing factor was the pregnancy and foetus was yet to be delivered. The teratogenicity from drugs and also the immune system needed to be considered. NMO cases generally tend to occur either too much early in lifestyle or moreover in later age but definitely with pregnancy needed to be considered.[10] In all of the studies, the postpartum relapse rate was very high than pre-pregnancy.[11] In this case there were no signs for relapse till the last follow up.

For the treatment after diagnosis, it was recommended to use azathioprine in addition to the Plasma exchange therapy, exactly as per the studies. The optimum treatment, glucocorticoids, were reported to be responsible for cleft palate in the first trimester and also growth restrictions hence needed to be avoided.[12] In our study It was followed completely.

4. CONCLUSION

NMO as a disease is rare but treatments are available to treat progression of a disease. Cure is not available yet but yes it can be controlled. Recurrence are the worst part. Here the patient was pregnant, major complications could have arrived. Patient was treated with prednisolone it may hinder the development of the foetus. Overall the patient delivered a healthy baby boy and needed to be on follow up every 3 months. Also report any of the earlier symptoms.

5. ABBREVIATIONS

NMO – NEUROMYELITIS OPTICA
AQP4 – AQUAPORIN-4 CHANNEL
CT- COMPUTED TOMOGRAPHY
LE- LOWER EXTREMITY
UE – UPPER EXTREMITY
PLEX – PLASMA EXCHANGE
MS – MULTIPLE SCLEROSIS
MOG- MYELIN OLIGODENDROCYTE GLYCOPROTEIN

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