CLINICAL MEETING

DEPARTMENT OF RESPIRATORY MEDICINE

DEPARTMENT OF RADIODIAGNOSIS

Two Cases of Pickwickian Syndrome

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CASE-1

52 years old gentleman, fabrication worker by profession with no history of substance use and no co morbidities

CHIEF COMPLAINTS

Breathlessness - since 4 days, MMRC Grade - 3

Fever - 4 days

- ***History of snoring (loud) since 20 years according to wife and his children***

- *History of Excessive Daytime Sleepiness (EDS) since 2 years increased since 2 months*

Epworth Sleepiness Scale – 17 (moderate sleepiness)
STOP BANG score > 5 (high risk for OSA)

Epworth Sleepiness Scale

Name: _____ Today's date: _____

Your age (Yrs): _____ Your sex (Male = M, Female = F): _____

How likely are you to doze off or fall asleep in the following situations, in contrast to feeling just tired?

This refers to your usual way of life in recent times.

Even if you haven't done some of these things recently try to work out how they would have affected you.

Use the following scale to choose the **most appropriate number** for each situation:

0 = would **never** doze
1 = **slight chance** of dozing
2 = **moderate chance** of dozing
3 = **high chance** of dozing

It is important that you answer each question as best you can.

Situation	Chance of Dozing (0-3)
Sitting and reading	
Watching TV	
Sitting, inactive in a public place (e.g. a theatre or a meeting)	
As a passenger in a car for an hour without a break	
Lying down to rest in the afternoon when circumstances permit	
Sitting and talking to someone	
Sitting quietly after a lunch without alcohol	
In a car, while stopped for a few minutes in the traffic	

STOP-Bang questionnaire

Please answer the following questions by checking "yes" or "no" for each one.

	Yes	No
Snoring (Do you snore loudly?)	❑	❑
Tiredness (Do you often feel tired, fatigued, or sleepy during the daytime?)	❑	❑
Observed Apnea (Has anyone observed that you stop breathing, or choke or gasp during your sleep?)	❑	❑
High Blood **P**ressure (Do you have or are you being treated for high blood pressure?)	❑	❑
BMI (Is your body mass index more than 35 kg per m^2?)	❑	❑
Age (Are you older than 50 years?)	❑	❑
Neck Circumference (Is your neck circumference greater than 40 cm [15.75 inches]?)	❑	❑
Gender (Are you male?)	❑	❑

Score 1 point for each positive response.

Scoring interpretation: 0 to 2 = low risk, 3 or 4 = intermediate risk, ≥5 = high risk.

CLINICAL EXAMINATION

On Admission,

- Patient was drowsy but arousable
- Height : 172cm Weight : **160 Kg** BMI: **55.17 Kg/m2 (CLASS 3- severe obesity)**
- Neck circumference – **53** cm
- Modified Mallampati score - **4**
- **Bilateral pitting pedal oedema**

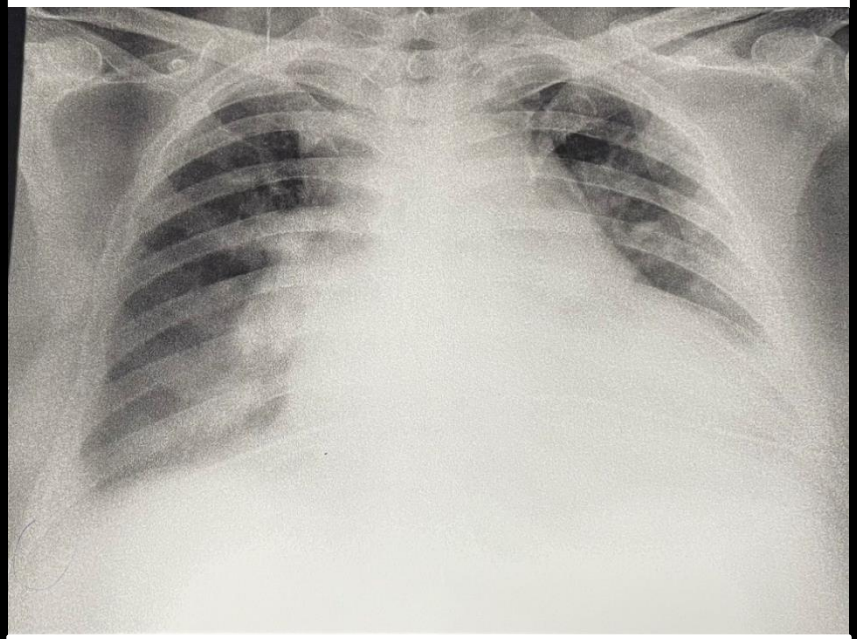
CLINICAL EXAMINATION.....*continued*

- Respiratory System examination:
- *On auscultation,* ***bilaterally equal breath sounds with reduced intensity heard***
- All other systems were normal limits

- **Vitals**:
- PR : 104/minute
- BP: 170/100 mmHg
- RR: 35 per minute
- Spo2 : 70% room air and was on FiO2 50% via Face Mask to maintain saturation 94 %

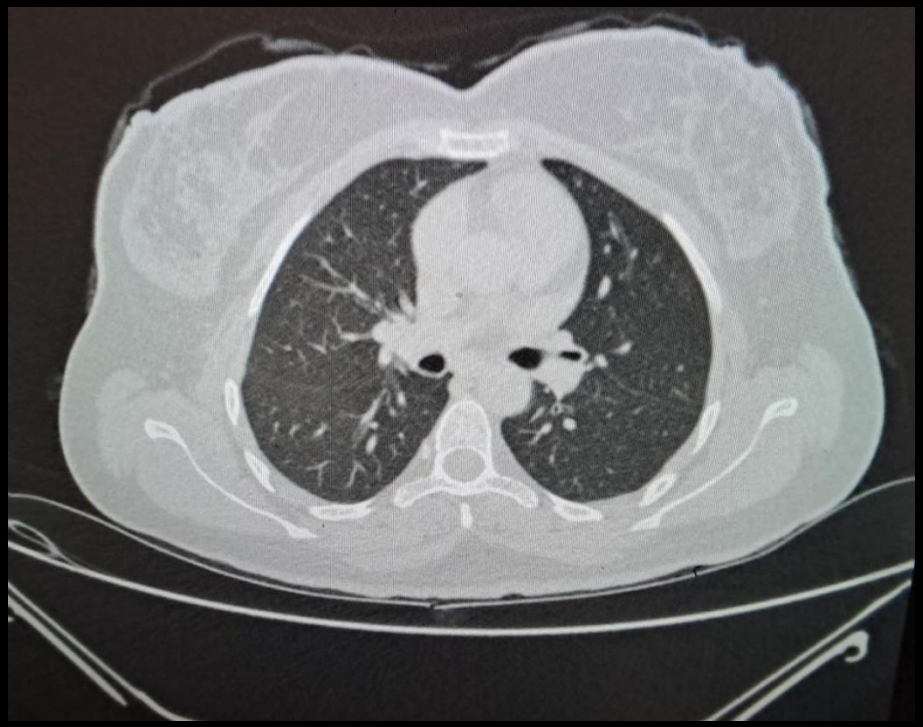
INVESTIGATIONS

X-RAY ON ADMISSION



Chest Radiograph shows Right side prominent Pulmonary Artery and apparent Cardiomegaly

- ECG - Sinus Rhythm
- Hemogram showed mild leucocytosis
- Biochemistry were within normal limits
- Thyroid function test was normal
- Fasting Lipid Profile was within normal limits
- Cardiac enzymes were normal
- 2D ECHO was showing mild PH



HRCT THORAX with no parenchymal abnormality

ABG ON ADMISSION Fi02 – 50%	
PH	**7.16**
PC02	92
PO2	55
HC03	38

Acute on Chronic Respiratory Failure -Type 2

COURSE IN THE HOSPITAL

Patient was kept on Non Invasive Ventilation for 4-6 hours and repeated an ABG showed worsening and hence patient was intubated

ABG ON FiO2 100%		
	Pre intubation	**Post intubation**
PH	7.10	7.34
PCO2	98	64
P02	57	93
HC03	40	34

Patient was treated with antibiotics and Low Molecular Weight Heparin and other supportive measures without any use of bronchodilators

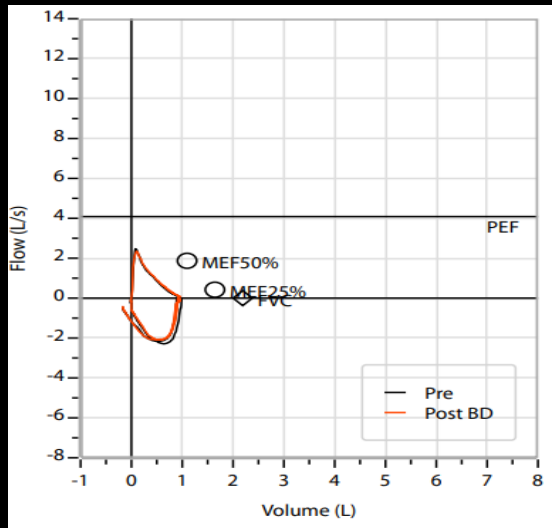
Subsequent ABG - resolving of Type 2 respiratory failure

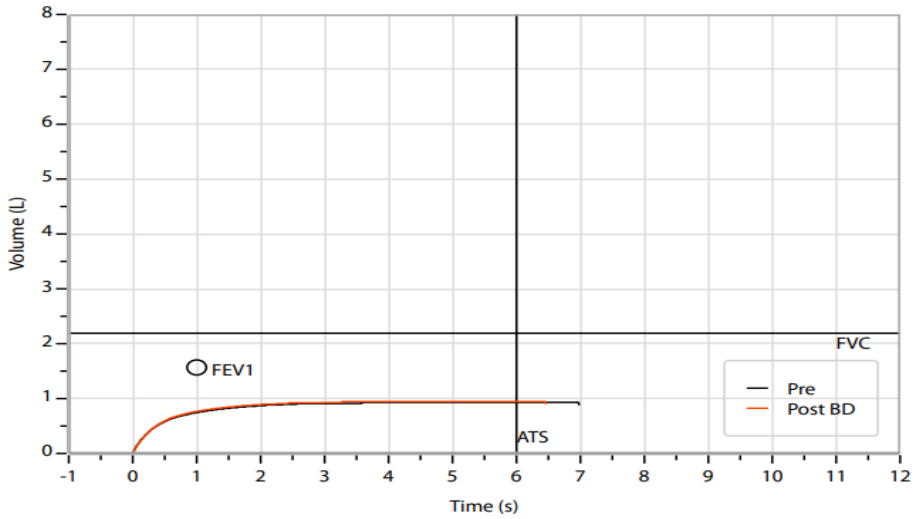
Patient was successfully extubated after 5 days and was kept on Bi-level PAP(NIV)

Nocturnal ABG on FiO2 - 28 %	
PH	7.34
PC02	**78**
PO2	72
HCO3	41

Daytime ABG on FiO2 - 28 %	
PH	7.36
PC02	**65**
P02	75
HC03	38

Nocturnal ABG was showing worsening of PCO2 when compared with Daytime ABG

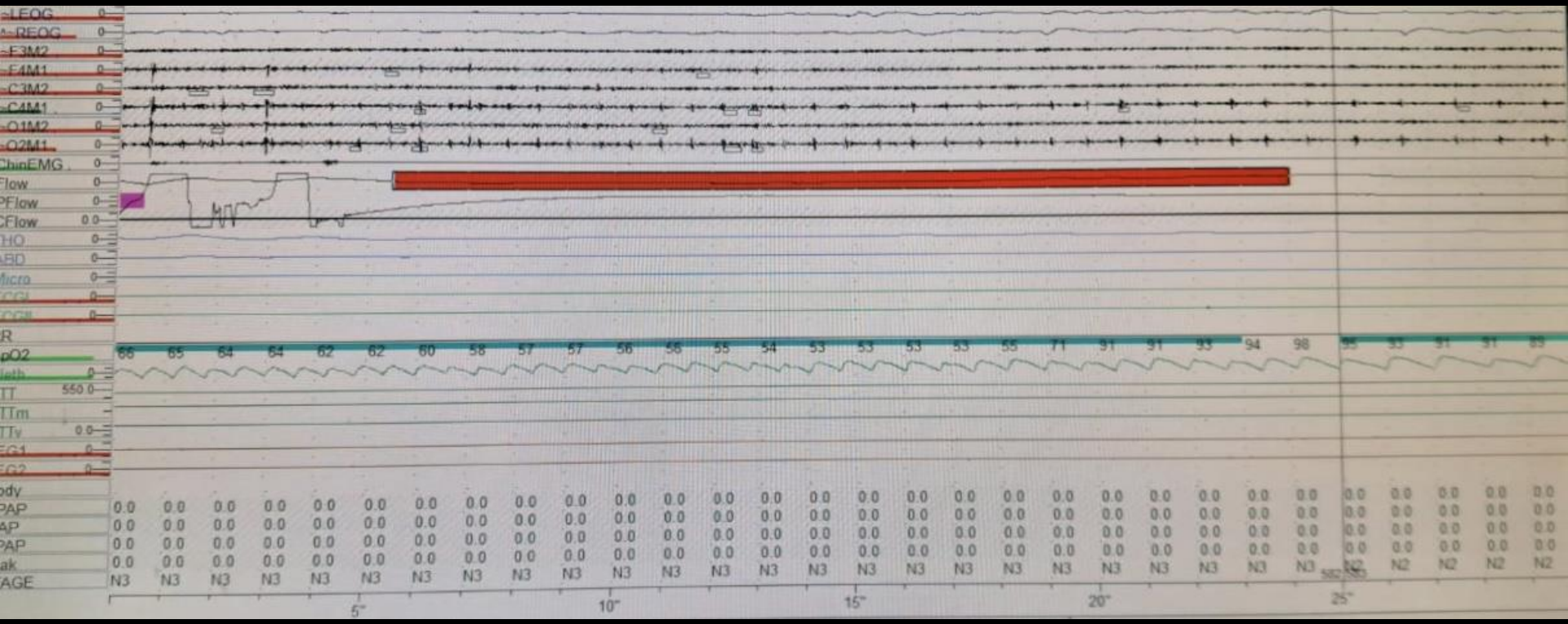




		PRE					POST BD (Salbutamol: 400 mcg)				
		Meas.	Normal Range	Pred	% Pred	z score	Meas.	Change	% Change	% Pred	z score
FVC	L	**0.98**	1.67 - 2.71	2.19	45	-3.85	**0.99**	0.01	1	45	-3.81
FEV1	L	**0.79**	1.10 - 2.04	1.57	50	-2.72	**0.81**	0.02	2	51	-2.66
FEV1/FVC%	%	**80.7**	63.9 - 80.3	72.1	112	1.73	**81.5**	0.8	1	113	1.89
PEF	L/s	**2.63**	2.95 - 5.66	4.09	64	-7.36	**2.35**	-0.28	-11	57	-8.77
FEF25-75%	L/s	**0.78**	0.81 - 2.24	1.35	58	-1.85	**0.84**	0.05	7	62	-1.67
MEF25%	L/s	**0.37**	< 1.03	0.42	88	-0.13	**0.42**	0.05	12	99	-0.01
MEF50%	L/s	**0.92**	1.16 - 3.03	1.87	49	-3.24	**0.96**	0.03	4	51	-3.12
MEF75%	L/s	**1.60**	---	-	-	-	**1.65**	0.05	3	-	-
FEV6	L	**0.00**	---	-	-	-	**0.00**	0.00	-	-	-
FEV1/FEV6%	%	**0.0**	---	-	-	-	**0.0**	0.0	-	-	-
FEV1/VCmax%	%	**80.7**	63.9 - 80.3	72.1	112	1.73	**81.5**	0.8	1	113	1.89

Spirometry –Severe Restriction (FVC -0.98 L; 45 %) with no obstruction

Polysomnography after observing the patient for 24-48 hours post extubation



Apnoea- Hypopnoea Index -74.2/hour **Baseline saturation -93%**

Lowest saturation- 28%

Suggested of *Obstructive Sleep Apnoea and Hypopnoea(Severe)*

Diagnosed as *Obesity Hypoventilation Syndrome with Severe OSA*

Patient was discharged from ICU after 7 days of admission -

Bi-level PAP (not affordable)

Advised weight reduction by lifestyle modification

Tablet Medroxyprogesterone acetate 60 mg daily OD for 14 days to augment ventilation

CASE 2

59 years old lady , homemaker with no history of substance use and no co morbidities with biomass fuel exposure of 20 years

CHIEF COMPLAINTS

Breathlessness

- 4 years increased since 7 days
- MMRC 1 to 3
- history of wheeze present
- Seasonal variation present

Cough

- 4 years increased since 7 days
- On and off
- mucoid expectoration
- Seasonal variation present

Fever

- since 5 days

HISTORY....*continued*

- *History of snoring (loud) since 5 years according to her children*
- *History of Excessive Daytime Sleepiness (EDS) since 2 months*

  Epworth Sleepiness Scale – 14 (moderate sleepiness)

  STOP BANG score > 5 (high risk for OSA)
- No h/o haemoptysis / chest pain

PAST HISTORY :

- Patient was a managed case of Asthma – COPD Overlap (ACO) for 7-8 years on inhalers and long term oxygen therapy for past 2 years

CLINICAL EXAMINATION

On Admission,

- Patient was drowsy but arousable
- Height : 155cm Weight : **120 Kg** BMI: **50 Kg/m2 (CLASS 3- severe obesity)**
- Neck circumference – **54 cm**
- Modified Mallampati score - **4**
- **Bilateral pitting pedal oedema**

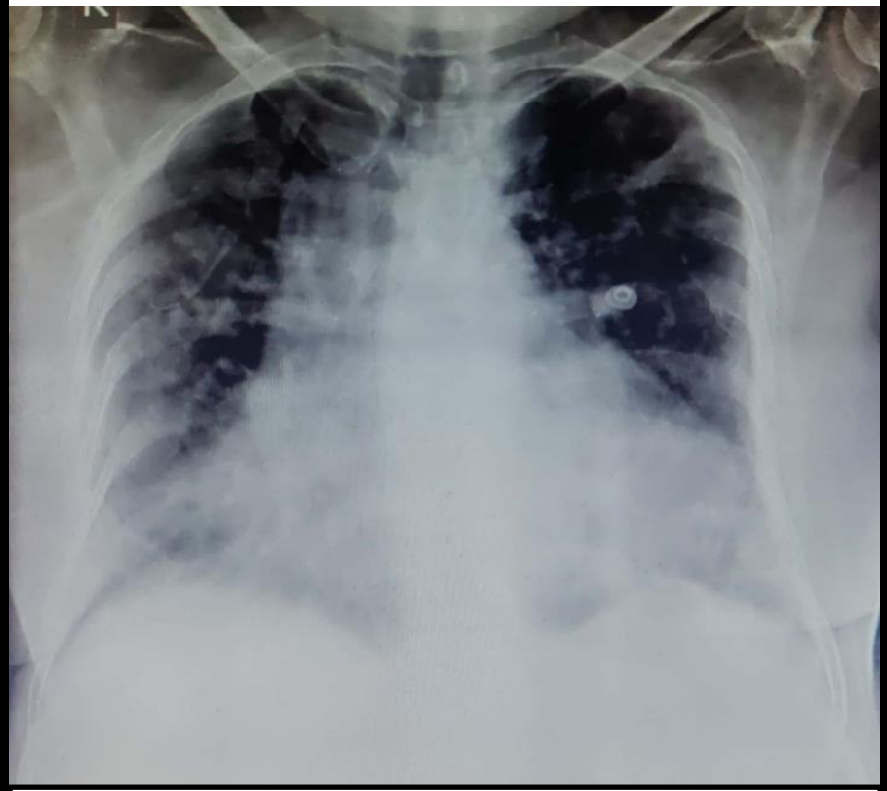
CLINICAL EXAMINATION.....*continued*

- Respiratory System examination:

  On Auscultation, ***polyphonic rhonchi and inspiratory crackles in infrascapular area bilaterally***
- All other systems were within normal limits

- **Vitals**:
- PR : 110/minute
- BP: 130/80 mmHg
- RR: 35 per minute
- Spo2 : 78% room air and was kept on FiO2 60% via Face Mask to keep saturation 94%

At the time of admission



Chest Radiograph showing Bilaterally inhomogeneous opacities in Mid zone and lower zone with apparent cardiomegaly

- ECG shows Sinus Rhythm
- Hemogram showed mild leucocytosis
- Biochemistry were within normal limits
- Sputum studies were negative
- Thyroid function test was normal
- Fasting Lipid Profile was within normal limits
- Cardiac enzymes were normal
- 2D ECHO was showing moderate PH

ABG at the time of admission FiO2 -70 %	
PH	7.3
PCO2	**75**
PO2	83
HCO3	47.5

Acute on Chronic type 2 Respiratory Failure

COURSE IN THE HOSPITAL

Patient was given bronchodilators via nebulizer and was kept on NIV along with other supportive measures

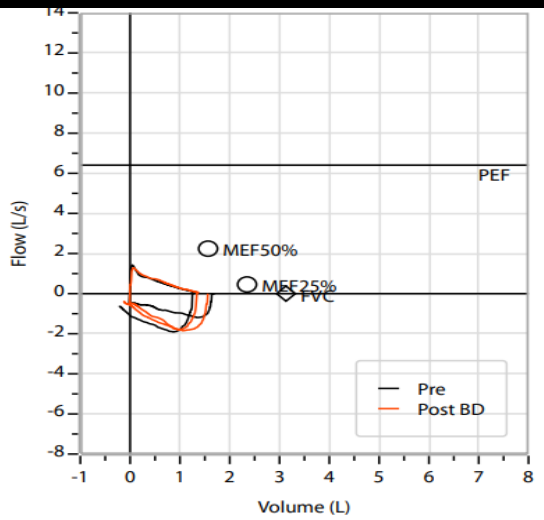
Repeat ABG after 4- 6 hours showed improvement

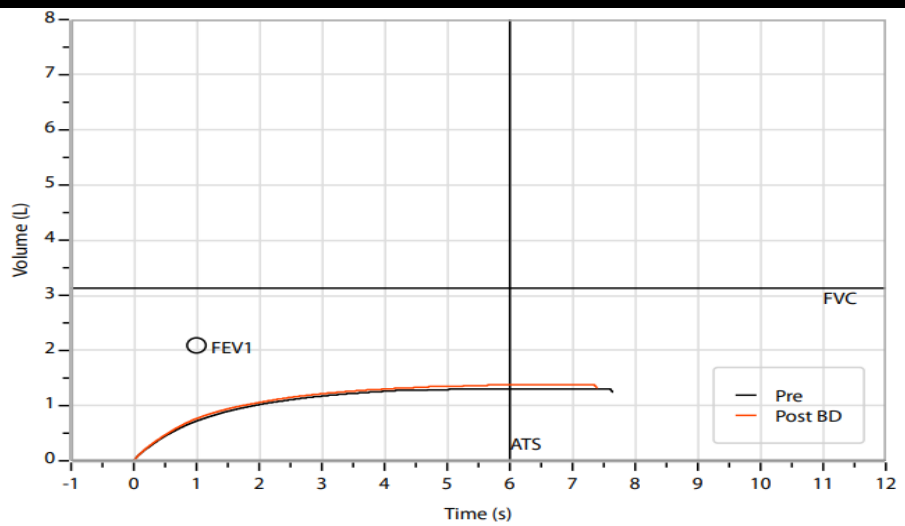
After 3 days of admission , patient was shifted to the ward with oxygen support and Bi-level PAP overnight along with other supportive measures

Nocturnal ABG on FiO2 28 %	
PH	7.32
PC02	80
PO2	79
HCO3	39

Daytime ABG on FiO2 28 %	
PH	7.36
PC02	65
P02	75
HC03	38

Nocturnal ABG was showing worsening of PCO2 when compared with Daytime ABG

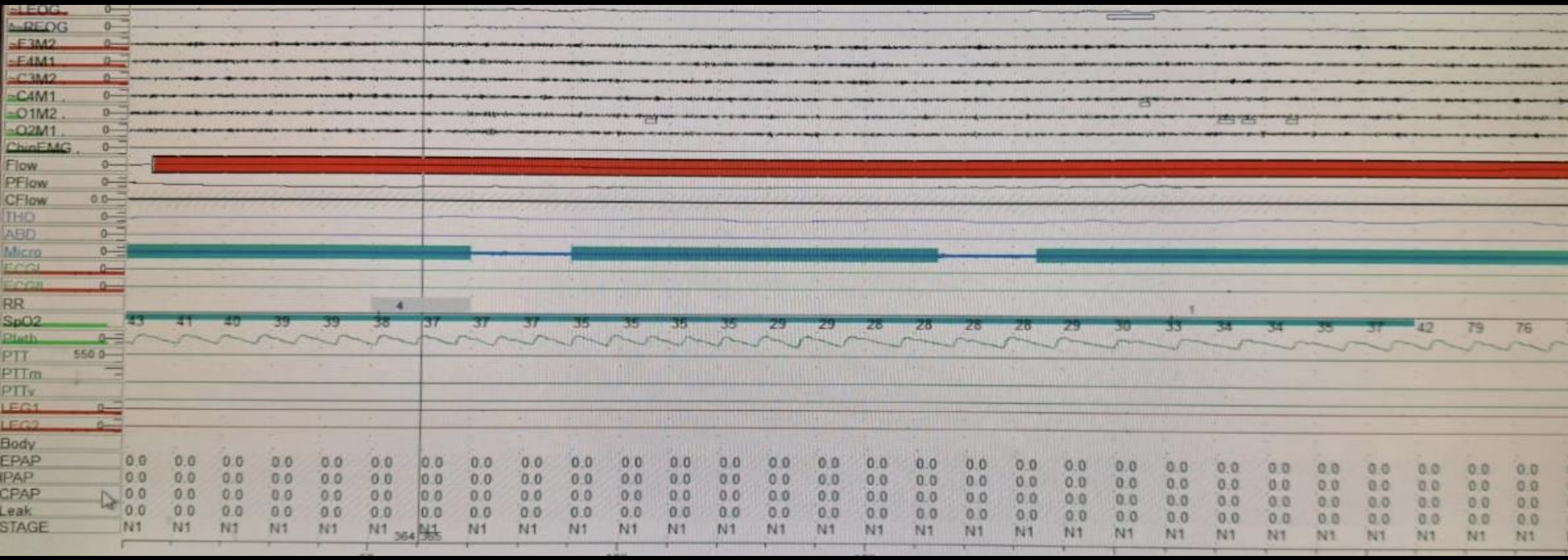




		PRE					POST BD (Salbutamol: 400 mcg)				
		Meas.	Normal Range	Pred	% Pred	z score	Meas.	Change	% Change	% Pred	z score
FVC	L	**1.33**	2.34 - 3.92	3.13	42	-3.76	**1.39**	0.06	5	45	-3.63
FEV1	L	**0.74**	1.43 - 2.75	2.09	35	-3.36	**0.77**	0.03	4	37	-3.29
FEV1/FVC%	%	**55.6**	63.1 - 82.2	72.6	77	-2.93	**55.1**	-0.5	-1	76	-3.02
PEF	L/s	**1.43**	4.94 - 8.31	6.41	22	-31.51	**1.29**	-0.14	-10	20	-32.42
FEF25-75%	L/s	**0.49**	0.74 - 1.80	1.15	42	-2.47	**0.49**	0.00	0	42	-2.47
MEF25%	L/s	**0.27**	0.26 - 0.81	0.46	60	-0.53	**0.24**	-0.03	-10	54	-0.60
MEF50%	L/s	**0.53**	1.46 - 3.45	2.24	24	-6.53	**0.57**	0.03	7	25	-6.39
MEF75%	L/s	**0.82**	---	-	-	-	**0.84**	0.03	3	-	-
FEV6	L	**0.00**	---	-	-	-	**0.00**	0.00	-	-	-
FEV1/FEV6%	%	**0.0**	---	-	-	-	**0.0**	0.0	-	-	-
FEV1/VCmax%	%	**55.6**	63.1 - 82.2	72.6	77	-2.93	**55.1**	-0.5	-1	76	-3.02

Spirometry - Severe Obstruction (FEV1/FVC-55.6) and no post bronchodilator responsiveness with Severe Restriction (FVC-1.33 L 42%)

Patient underwent Polysomnography



Apnoea- Hypopnoea Index -72.7/hour Baseline saturation -94%

Lowest Saturation- 44%

Suggested of *Obstructive Sleep Apnoea and Hypopnoea(Severe)*

DIAGNOSIS

- Obesity Hypoventilation Syndrome with Severe Obstructive Sleep Apnoea
- Asthma-COPD Overlap

MANAGEMENT

Patient was discharged after 10 days of admission with -

- **Long term Oxygen Therapy**
- **Bi –Level PAP**
- **Inhalational therapy with ICS+ LABA+LAMA and other supportive measures**
- **Advised weight reduction by exercise and Bariatric surgeries**

DISCUSSION

OBESITY HYPOVENTILATION SYNDROME (OHS) /PICKWICKIAN SYNDROME

Joe, the fat boy , character in Charles Dickens novel called 'Pickwick Paper' had features of snoring , obesity and sleepiness

Defined as ***the presence of awake alveolar hypoventilation in an obese individual which cannot be attributed to other conditions associated with alveolar hypoventilation.***

OHS is associated with increased cardiovascular morbidity and mortality

DIAGNOSTIC CRITERIA FOR OHS

- BMI > 30 Kg/m2
- Daytime PC02 >45mmHg
- Serum HCO3 > 27 mEq/L (with no metabolic alkalosis)
- With no prior lung disease
- Nocturnal desaturation (>4%)

EUROPEAN RESPIRATORY SOCIETY STAGING OF OHS

OSA with no hypercapnia (STAGE 0)

Obesity associated sleep hypoventilation but normal awake PCO2 and serum HCO3 < 27 mmol/L (STAGE 1)

Obesity associated sleep hypoventilation but normal awake PCO2 and serum HCO3 > 27 mmol/L (STAGE 2)

With or without OSA but no cardiovascular complications (STAGE 3)

With or without OSA but with cardiovascular complications (STAGE 4)

CLINICAL PEARLS

OHS is an under diagnosed clinical entity

All obese patients must be clinically evaluated for OSA

For diagnosis of OSA ,there should be high index of clinical suspicion especially among Pulmonologists, Physicians, Critical Care Physicians, Anesthesiologist, ENT Surgeons, EM Physicians