NCCP(I) - PROF. DR. S. N. GAUR’S YOUNG SCIENTIST AWARD

Endobronchial ultrasound experiences in a tertiary care centre for last two year and the yield of endobronchial ultrasound
Introduction: Pulmonary medicine is advancing by leaps and bounds. New innovative gadgets are improving diagnosis and management of patient, day by day. One of such technique is EBUS, which is a bronchoscopic technique that uses ultrasound to visualize structures within and around airway wall and lung. EBUS is a minimally invasive and safe procedure that can also be performed on outpatient basis with moderate sedation. EBUS helps in taking samples from mediastinal nodes and previously in accessible areas of mediastinum. According to western studies, EBUS helps in staging lung cancer, bronchial tree towards the appropriate area of mediastinum. The targeted lymphnodes or mass were identified using bronchoscopic visualization and ultrasound imaging. A 22G needle extended from the bronchoscope through the bronchial wall is used to puncture the lesion and to aspirate tissue. EBUS-TBNA have performed with at least three psses of the needle per lesion. The aspirates are then smeared on slides and simultaneously sent to pathology laboratory for subsequent cytology. The cytology sample is considered adequate if it contained malignant cells which is confirmed by a cytologist and then the procedure is terminated.

Results: A total of 70 EBUS performed in our institute in last 24 months in 37 males and 33 females. The commonest indication for doing EBUS was breathlessness and fever followed by PET CT showing mediastinal nodes. The commonest station of sample collected is station 7. The common in our center is TUBERCULOSIS followed by malignancy and metastatic nodes, sarcoidosis, organising pneumonia and hypersensitivity pneumonitis, sarcoid like granulomatous reaction and other rare diagnosis.

Conclusion: EBUS is the new technology in field of pulmonary medicine which also gives diagnosis of Tuberculosis and sarcoidosis which will be missed if mediastinal node biopsy is not done. Hence early diagnosis of Tuberculosis can be established along with metastatic nodes and staging of lung cancer.

Evaluation of indications, contra-indications and willingness for lung transplant in patients with chronic respiratory illness at a tertiary care centre

Background: Chronic respiratory diseases often progress despite maximal medical therapy and lung transplant (LT) is a potentially life-altering treatment option. However, awareness and acceptance in India are low.

Methods: An observational prospective study was carried out in patients referred for lung transplant, who were evaluated for parameters contributing to referral and listing for LT and to identify the presence of contraindications.

Results: Out of 91 referred patients, 81 met listing criteria with a younger (mean age 47 years) and predominantly male (61.5%) population. Most common diagnosis were interstitial lung disease (ILD) (57.1%), bronchiectasis (16.5%) and chronic obstructive pulmonary disease (COPD) (14.3%). Among ILD, NSIP (27%) and Hypersentivity pneumonitis (23%) were the most common diagnosis; ‘any dyspnoea or functional limitation’ was the most common referral criteria (RC) (100%), and ‘Hospitalization because of respiratory decline’ was the most common listing criteria (LC). Only 37% (18 of 48 meeting listing criteria) were willing for LT. Among COPD, progressive disease was the most common RC (93%) and severe hypercapnic exacerbation was the most common LC (86%). Half (51%) of the referred patients had contraindications for LT with severely limited functional status (8.8%), absence of reliable social support (6.6%), and substance abuse (5.5%) being most common.

Conclusion: Although most patients fulfill RC and LC criteria (89%), over half had contraindications and only a third of eligible patients were willing for LT. There is an urgent need to increase public and physician awareness about LT for chronic lung diseases and the importance of timely referral.

To assess the predictive ability of the STOPBANG questionnaire, and the Epworth Sleepiness Scale in identifying obstructive sleep apnoea and comparing their efficacy with polysomnography

Background: Obstructive sleep apnoea is a major public health problem. Community-based epidemiological studies from several parts of India have estimated that the prevalence of OSAS is 2.4% to 4.96% in men and 1% to 2 % in women.

Materials and Methods: This study aimed at comparing the two sleep questionnaires result with the result of polysomnography as regards their predictive ability in identifying OSA. Two sleep questionnaires (STOPBANG questionnaire and ESS ) were administered to the patients
Impact of COVID 19 infection on patients with obstructive sleep apnea: A longitudinal study

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**Background:** OSA patients like other high risk category patients suffered and experienced post covid syndromes significantly.

**Aim:** To study the severity and impact of COVID 19 infection in patients already diagnosed with Obstructive Sleep Apnea (OSA).

**Methodology:** This is a longitudinal observational study of 19 patients diagnosed with OSA in January to April 2021. These patients suffered COVID 19 infection over next three months and 12 patients were studied within 4 months of discharge from COVID ward as 5 patients died and 2 patients lost to follow up.12 subjects had mean age of 52.92 (SD: 6.88) and majority were male 8 (66.7%) and mean BMI was 27.72 (SD: 3.60). Subjects were assessed through COVID 19 infection medical record, repeat Epworth Sleepiness Score and present complaints and Polysomnography.

**Results:** Most of the OSA patients (66.7%) suffered from Severe COVID 19 infection and of them majority were male (62.5%). Severity of COVID correlated significantly with BMI and AHI (r=0.774; p<0.003 and r=0.907; p<0.001) and associated with more use of high flow oxygen device and noninvasive ventilation with mean hospital stay of 27.33 (SD:10.7). Mean AHI, ESS scores increased in post covid period (mean AHI-22.58; SD: 11.12 to 24.58; SD: 12.01 and mean ESS- 15.08; SD: 3.67 to 18.67; SD: 3.52) significantly (r=0.907;p<0.001 and r= 0.893;p<0.001 respectively) and maximum desaturation dropped significantly from mean 83.33 (SD: 4.83) to 79.50 (SD: 4.81) (r=0.727; p=0.007).

**Conclusion:** This study reveals that OSA patients suffered from severe COVID 19 infection. Sleepiness and severity of OSA both has increased in post COVID period. This result may be an explanation for persistent post COVID symptoms in OSA patients.

Vitamin D levels in asthma and allergic bronchopulmonary aspergillosis and its co-relation with airway inflammation

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**Background:** Allergic bronchopulmonary aspergillosis (ABPA) is hypersensitivity reaction against Aspergillus. It involves up regulation of Th2 cytokines. Although an association of low vitamin D levels with poor asthma control is known but the prevalence of vitamin D deficiency in ABPA remains unknown. This study evaluated vitamin
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D (25[OH]D) levels in asthma and ABPA patients; and their correlation with airway inflammation.

**Methodology:** It’s a prospective study containing patients of asthma (n=50) and ABPA (n=50) and 30 healthy controls. Vitamin D levels, FeNO, absolute eosinophil count, serum total IgE, FeNO, cytokines (IL-4, 6, 10 and 17) and lung function tests were assessed in all subjects. Statistical analysis was done to find out appropriate correlation.

**Results:** The study included 131 subjects. The mean age of asthma and ABPA patients was 40.40 ± 13.22 and 39.76 ± 14.93 respectively. There were 65 females and 64 males. The mean vitamin D levels in asthma, ABPA and controls were 29.13 ± 18.48, 34.18 ± 21.88 and 41.12 ± 23.10, respectively. The difference in vitamin D distribution between the three groups in is statistically significant (p=0.009). S. Total IgE (IU/ml), IL-4 (pg/ml), IL-6 (pg/ml) levels were associated significantly (p<0.05) with Vitamin D levels in asthma whereas lung functions were not. No such correlation was observed in ABPA.

**Conclusion:** Vitamin D deficiency is common in asthma patients but less common in ABPA. No significant correlation between vitamin D deficiency and lung function in both the disease entities.

“Pleural pustule” a novel pleuroscopic appearance in tuberculous pleural effusion: A single centre experience

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**Background:** Thoracoscopic pleural biopsy is the gold standard in diagnosis of Tubercular pleural effusion (TB-PLEF). Various thoracoscopic appearance’s such as ‘Sago Grain’ nodules, small nodules, pleural thickening, caseous necrosis and adhesions have been described in TB-PLEF. However, none of these findings have a high specificity. In this study we evaluated a novel finding on thoracoscopy, the ‘Pleural Pustule’.

**Methods:** This study is a retrospective observational study conducted at Yashoda Hospital, Somajiguda between January 2019 and December 2021. All patients undergoing thoracoscopy for an undiagnosed exudative pleural effusion were included. Patients who had a ‘Pleural Pustule’ on visual inspection of the pleura were further analyzed.

**Results:** 266 patients were included, of which 16 patients had at least 1 pleural pustule on visual inspection. All 16 patients were diagnosed to have TB-PLEF. Histopathological examination demonstrated necrotizing granulomatous inflammation in all. In patients with a pleural pustule microbiological diagnosis of tuberculosis was achieved in 93.75% patients [AFB smear positive in 5 (31.25%), Xpert MTB/RIF Ultra -MTB detected in 15 (93.75%) and MTB culture positive in 7 (43.75%)] against 68.75% patients with ‘Sago Grain’ appearance and 48.9% in all TB-PLEF patients. Presence of pleural pustule had a sensitivity, specificity and PPV of 17.02%, 100% and 100% respectively.

**Conclusion:** As per our study ‘Pleural pustule’ is a specific finding for TB-PLEF. It has a higher specificity and PPV than ‘sago grain’ appearance. Patients with a ‘pleural pustule’ had significantly higher microbiological positivity rate. We propose this novel finding as a new pathognomonic feature for TB-PLEF.

Profile of anti-tubercular drug resistance and distribution of its conferring gene mutations in the state

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**Introduction:** Though non-compliance, inadequate dosage and inappropriate administration are cited to be pivotal causes for the increasing drug resistance in Tuberculosis, many research studies have identified certain patient characteristics that contribute to drug resistance despite an adequate and appropriately administered regular Anti-tubercular treatment.

**Objective:** To determine the profile of anti-tubercular drug resistance and the frequency-distribution of its conferring mutations.

**Methodology:** The prospective longitudinal hospital based study was conducted over 1 and half year on all microbiologically confirmed cases of Tuberculosis and followed up to access the drug resistance pattern.

**Results:** Amongst the analysed 233 cases, majority i.e 71.2% had Rifampicin, 55.4% had Isoniazid, 16.7% had Fluoroquinolone, 6.4% had Pyrazinamide and 3.9% had SLID resistance in the state. Most prevalent mutation causing Rifampicin Resistance was observed to be MUT 3 (S531L) at rpoB locus, INH resistance was MUT1 (S315T1) at kat G locus, Fluoroquinolone Resistance was MUT3C (D94G) at gyrA locus and SLID resistance was MUT1 (A1401G) at rrs locus. Statistical significance was noted between association of age with polyresistance. However, no such association was noted between age, gender and demography and individual drug resistance or their gene mutations. Strong statistical association was found between various drug resistance and co-morbidities.

**Conclusion:** We concluded that the drug resistance and mutation profile if studied in various age groups, gender and geographical areas can aid in predicting an emerging pattern of drug resistance that can be vital at exercising early and timely interventions in order to meet the WHO’s End TB Strategy 2025 targets.

Cryo-biopsy by kissing technique twin bronchoscopy: A study of 169 cases original study
Background: Now a days, Transbronchial lung biopsy is common procedure performed to diagnose various lung pathologies. TBLB (Trans-bronchial Lung Biopsy) forceps yields much smaller samples. Also, bleeding remains a constant factor in these procedures. To subvert this, we have started twin bronchoscopy guided cryobiopsy for bigger sample size and prevent & bleeding.

Methodology: We insert a standard FOB (Fibre-Optic Bronchoscope, outer diameter 4.2 mm, channel diameter 2.2 mm) intranasally & reach just above the area from where biopsy has to be taken; this site was determined pre-operatively by chest X-ray and CT scans. Then, we inserted a Fogarty’s catheter through FOB’s suction channel and protruded it at the biopsy site& inflated it. The Fogarty’s catheter was checked beforehand for any leaks. Now, we applied our novel approach and inserted another video-bronchoscope (VOB, outer diameter 5.8 mm, channel diameter 2.8 mm) by oral route through the bite-block and slipped it through the vocal cords by the side of the FOB. Cryobiopsy forceps was inserted through the VOB channel, it was forwarded under the C-arm and when we were away from the pleura by 10-20 mm, we stopped and took the biopsy samples.

Results: There were 54 cases of primary & 21 cases of metastatic cancers, followed by ILD 14, undiagnosed pneumonias 24, tuberculosis 33, etc. The detailed results will be presented.

Discussion: There were no major limitations of this procedure using 2 bronchoscopes, one intra-nasally & one through the oral cavity. No major adverse events were encountered.