were identified in both asthma and non-asthma patients (table 1). Whilst airflow limitation, BDR, airway inflammation and bronchial hyperresponsiveness were more prevalent in asthma than non-asthma, exercise-induced symptoms were equally prevalent in both groups, as were extrapulmonary features such as obesity, rhinitis and atopy. There were more current smokers in asthma (21.4%) compared to non-asthma (7.7%, $p<0.05$), but psychosocial history and medication compliance during trial of ICS were similar in both groups. Reflux was the most prevalent TT identified in non-asthma (77.8%), found almost twice as commonly as in asthma (40.4%, $p=0.005$). Although atopy was the single most common feature in asthma (73.8%), the majority of non-asthmatics were also sensitised (55.6%). Four of 15 (26.7%, three with asthma) symptomatic and pet-sensitised patients had ongoing pet exposures.

Conclusion Treatable traits are common in patients with symptoms of asthma regardless of diagnostic labels, although the patterns of prominent features may be different, suggesting that personalised management strategy could be offered to symptomatic patients both with and without confirmed asthma. Future research should focus on further characterisation of TT in symptomatic patients with uncertain diagnosis.

Oxygen, CPAP, NIV or ICU: what works in COVID-19?

P210 NOT ALL COVID-19 DEATHS ARE HYPOXIC: OBSERVATIONAL COHORT STUDY OF PATIENTS WHO DIED AT THE NIGHTINGALE HOSPITAL EXETER

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The Nightingale Hospital Exeter (NHE) with 116 beds designed to deliver respiratory support including non-invasive ventilation and high flow nasal oxygen, managed 242 patients with Covid-19 from November 2020 to February 2021. Patients considered candidates for invasive ventilation were not transferred to NHE. In those who died there were two observed modes of death: those that were hypoxic and patients that died without any significant hypoxia. Hypoxic respiratory failure is well-documented as a cause of death in Covid-19 but the mechanism of death in non-hypoxic patients remains incompletely understood.

Methods Electronic patient records were retrospectively reviewed for all deaths at the NHE between 26.11.2020 and 24.02.2021. Data collection included patient characteristics, pre-morbid function and pre-existing respiratory and neurological comorbidities, cause of death at certification, oxygen saturations, FiO₂ and level of respiratory support both on admission, last recorded prior to death and the maximum required during admission. Hypoxia was considered significant if the last recorded oxygen saturations prior to death or palliation were $< 88\%$ irrespective of FiO₂ or if the patient was receiving $> 30\%$ inspired oxygen.

Results A total of 242 patients from eight NHS Trusts were admitted to the NHE, and 37 (15%) died. Of the patients

Abstract P210 Table 1 Patient demographics of Covid related deaths with and without hypoxia

	Hypoxic	Non-hypoxic
Age (years)	84	89
Days from positive swab to death (days)	12	19
Pre-existing respiratory disease (total (%))	5 (40%)	10 (42%)
Pre-existing neurological condition (total (%))	13 (52%)	7 (58%)
Death attributed to Covid-19 (total (%))	22 (88%)	6 (50%)

that died, 32% had no significant hypoxia. Table 1 compares the two groups. Five patients were treated with high flow nasal oxygen, all of whom died hypoxic. In non-hypoxic patients with an alternative cause of death these were either pneumonia, sepsis or dementia.

Discussion Atypical presentations of Covid-19 in the elderly are well-documented. We observed a population of patients who died after testing positive for Covid-19 who were not hypoxic, but had no other cause of death other than Covid-19 identified. Neither underlying respiratory disease nor underlying neurological conditions predicted mode of death although there was a trend towards a hypoxic death in younger patients. Few studies have looked at underlying cause of death from Covid-19 beyond its hypoxic and cardiovascular effects and further research is needed to understand the additional modes of death caused by this virus.

P211 COMPARING OUTCOMES AND CHARACTERISTICS OF COVID-19 PATIENTS TREATED WITH CPAP INSIDE AND OUTSIDE OF THE INTENSIVE CARE UNIT

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Introduction and Objectives Continuous Positive Airway Pressure (CPAP) has been widely adopted to manage hypoxaemic respiratory failure secondary to COVID-19 pneumonia. Currently promising data is available to suggest the success this as a definitive treatment for such patients, both inside and outside of the ICU. We aim to compare the outcomes and characteristics of patients treated with CPAP in these two settings.

Methods In this single-centre prospective observational study we observed the baseline characteristics, physiological observations, laboratory tests, and outcomes of all consecutive patients with COVID-19 pneumonia between April 2020 and March 2021 treated with CPAP. We report data from patients treated in both the ICU and the designated COVID-19 Respiratory Support Unit.

Results We report the outcomes of 187 patients (Mean Age = 66.1[SD=12.7], 64% Male [n=120]) with COVID-19 pneumonia treated with CPAP in a single NHS trust. Overall mortality for these patients was 45% (n=84), this was significantly higher for the patients treated outside of the ICU (29% vs 60%, $p<0.001$). Those who received CPAP in the ICU were significantly younger than those treated outside of this setting (Mean Age (SD) = 61.2 (13.9) vs. 70.9 (11.8), $p<0.001$). The group of patients treated outside of

the ICU were found to be significantly more comorbid, having significantly higher proportions of hypertension (41% vs 59%, $p=0.005$), diabetes mellitus (18% vs 38%, $p<0.001$), COPD (13% vs 28%, $p=0.008$), asthma (8% vs 18%, $p=0.031$), ischaemic heart disease (11% vs 27%, $p=0.003$), and a history of smoking (33% vs 59%, $p<0.001$). We do not report any differences in the duration of treatment with CPAP.

Conclusions In our report we found that inpatient mortality of those treated inside of the ICU was significantly lower than that of those treated outside of this setting, however, those

treated in the ICU were also significantly younger and had fewer comorbidities. Despite the higher mortality outside of the ICU, 40% of patients treated in this setting survived to discharge, this may suggest that those who may be deemed unsuitable for treatment with CPAP on the ICU can be managed safely outside of this setting.

Abstract P211 Table 1 Displaying baseline characteristics, physiological observations, laboratory tests, and outcomes of all patients treated with CPAP and comparing these observations between those treated inside and outside of the ICU

	All Patients (n=187)	ICU (n=90)	Non-ICU (n=97)	p-value
Age - Mean (SD)	66.1 (12.7)	61.2 (13.9)	70.9 (11.8)	<0.001
Male - n (%)	120 (64)	57 (63)	63 (65)	0.530
CPAP duration in days - Median (range)	4 (1-48)	4 (1-20)	4 (1-48)	0.356
Inpatient Death - n (%)	84 (45)	26 (29)	58 (60)	<0.001
Comorbidities - n (%)				
HTN	94 (50)	37 (41)	57 (59)	0.005
Diabetes Mellitus	53 (28)	16 (18)	37 (38)	<0.001
COPD	39 (21)	12 (13)	27 (28)	0.008
Asthma	24 (13)	7 (8)	17 (18)	0.031
IHD	36 (19)	10 (11)	26 (27)	0.003
Smoking History	87 (47)	30 (33)	57 (59)	<0.001
Obesity	69 (37)	36 (40)	33 (34)	0.108
Laboratory Results - Mean (SD)				
Admission WCC - $\times 10^9/L$	9.8 (4.4)	11.0 (6.3)	8.8 (4.2)	0.016
Admission lymphocyte count - $\times 10^9/L$	1.25 (0.64)	1.94 (0.81)	1.18 (0.95)	0.190
Admission Urea - mmol/L	9.3 (6.7)	7.8 (4.2)	10.6 (7.8)	0.006
Admission C-reactive Protein - mg/L	135.8 (101.5)	135.2 (102.0)	130.1 (90.8)	0.750
Observations pre-CPAP - Mean (SD)				
Respiratory Rate	25.8 (6.4)	26.4 (6.9)	25.7 (6.0)	0.345
Heart Rate	92.4 (20.4)	96.9 (21.7)	89.8 (19.7)	0.044
Oxygen Saturations	88.8 (7.1)	88.7 (7.3)	88.4 (6.7)	0.280
FiO2 - %	59.9 (22.9)	58.9 (32.3)	66.1 (17.5)	0.074
Arterial Blood Gas Results pre-CPAP - Mean (SD)				
Arterial pH	7.44 (0.08)	7.45 (0.07)	7.44 (0.07)	0.484
Arterial pO2 - kPa	7.4 (1.4)	7.4 (1.3)	7.4 (1.5)	0.796
Arterial Base Excess - mmol/L	0.6 (4.9)	0.7 (3.6)	0.5 (5.0)	0.813

P212 NON-INVASIVE RESPIRATORY SUPPORT IN ADULTS WITH COVID-19 WHO ARE NOT FOR INTUBATION: THE BALANCE BETWEEN SAVING LIVES AND PROLONGING DEATH

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Introduction Non-invasive respiratory support (NIRS) has been used in adults with COVID-19 who are not for intubation (DNI), but mortality in this group was as high as 89% in the first wave (1). To our knowledge, there is no data on outcomes after advances such as steroids, and on factors associated with effective NIRS in this group.

Methods We retrospectively collected data on all adults with COVID-19 who were treated with NIRS between 17/9/2020 and 30/1/2021 during the 'second wave' in our hospital. Logistic regression was used to review the multi-variate association between mortality and investigated factors.

Results In our respiratory wards, 309 adults received NIRS, of whom 106 had a DNI.

Adults with a DNI were older and more multi-morbid (see Table 1). Mortality in adults with a DNI compared to those without was significantly higher (74.5% vs. 26.2%, p -value<0.001; odds ratio (OR) 8.20, 95% confidence interval (CI) 4.78-14.21), even after adjusting for age and comorbidities (OR 3.03, 95% CI 1.35-6.81).

There were few factors which predicted effective NIRS in this group (see table 1). 92.1% of 38 adults who received sedatives to improve tolerance died.

Discussion Even allowing for age and multi-morbidity and despite advances in treating COVID-19, mortality remains high at 74.5% for adults with a DNI who require NIRS.

There is little guidance on using NIRS in this group, with one large clinical trial excluding adults with a DNI (2). NIRS has disadvantages; it may present a significant treatment burden and patients who required sedation to aid compliance had higher mortality. Furthermore, there are few factors to guide which patients benefit. There are thus ethical implications to offering NIRS, especially in resource-strained settings.

More research is urgently required in this group, especially for future waves. Meanwhile, clinicians should sensitively discuss the risks of treatment failure and involve palliative care to help manage distressing symptoms such as breathlessness and anxiety.

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