Treatment response during systemic asthma exacerbation therapy

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AIMS

- The course of clinical parameters in patients with a standard acute asthma exacerbation (AAE) treatment
- The risk for extended AAE treatment for different treatment outcomes
- The relation between FeNO trajectories during AAE treatment and clinical parameters as possible predictor for treatment response

METHODS

- Multicentre observational study (ExCluSieF study; NCT05304039)
- Monitoring during standard AAE treatment (figure 1)
- Extended treatment defined as extra AAE treatment (systemic corticosteroids (SCS) or antibiotics after initial treatment)
- Selection criteria:
  - Patients with an AAE between 18 and 70 years, with indication for SCS
  - No active – autoimmune diseases
  - No chronic use of immunosuppressive or modulating medication
  - No pregnancy

STUDY DESIGN

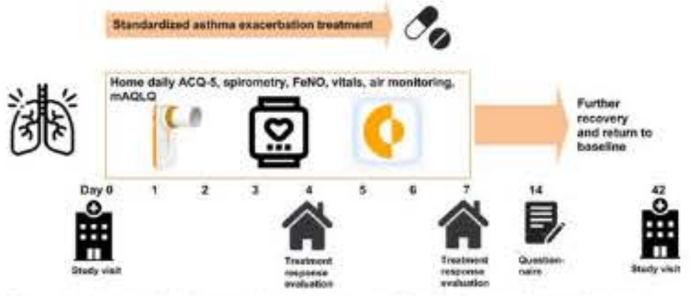

Figure 1: Study design. ACQ-5 = Asthma Control Questionnaire 5, FeNO = Fractional Exhaled Nitric Oxide, mAQLQ = Mini Asthma Quality of Life Questionnaire

STUDY POPULATION

Age (years)	45.0 [35.0 – 57.3]
Female gender	77.9 %
BMI (kg/m²)	28.0 [24.6 – 32.3]
Smoking: Current/ex-smoker/non-smoker	10.6 / 32.0 / 57.4 %
T2 high / T2 low / unknown	59.8 / 35.2 / 4.9 %

Table 1: Baseline characteristics described as frequency or median with interquartile range. BMI = Body Mass Index. T2 = Type 2 inflammation (at baseline)

RESULTS

- In total, 122 participants completed the study.
- Twenty-one participants (17.2%) received antibiotics next to SCS.
- Asthma control (ACQ-5) improved significant; difference of 1.2 points [IQR: 0.4 – 2.0] (p<0.001), no difference in FEV1 -0.01 l [-0.35 - 0.29].
- In 42.3 % of the participants, a virus or atypical bacteria was found; especially rhinovirus, RSV, and *M. pneumoniae*.
- The FeNO trajectories without difference in ΔACQ-5 or ΔFEV1.

FENO TRAJECTORIES

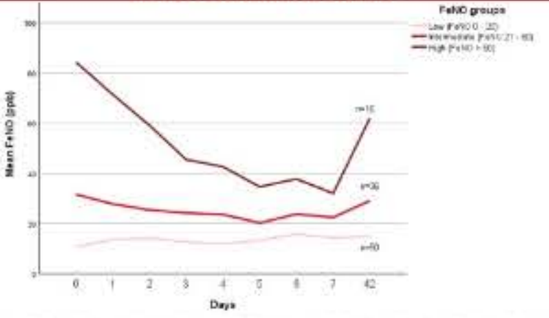

Figure 2: Mean of Fractional exhaled nitric oxide (FeNO) shown during the study days, divided in 3 groups based on FeNO measurement on the first day.

COMBINED TREATMENT RESPONSE

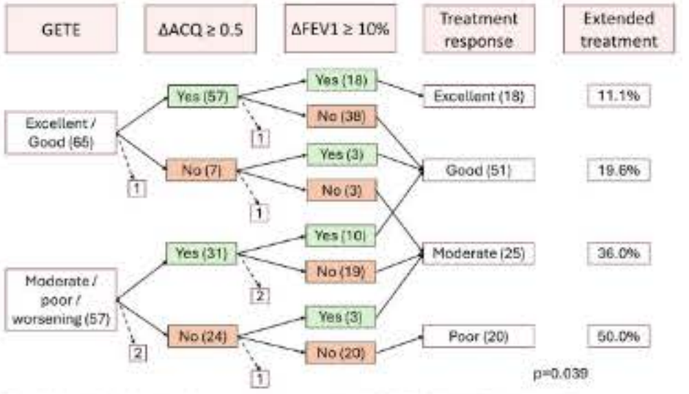

Figure 3: Predefined flowchart for treatment response day 0 – 7. GETE = Global Evaluation of Treatment Effectiveness, ACQ = Asthma Control Questionnaire 5, FEV1 = Forced Expiratory Volume in first second.

T2 PROFILES BASELINE AND EXACERBATION

Baseline phenotype	*Exacerbation T2 high*	*Exacerbation T2 low*
T2 high	40	7
T2 low	9	21

Table 2: Baseline phenotype as described in electronic dossier. Exacerbation phenotype based on eosinophils ≥ 0.25 x10⁹/L and/or FeNO ≥ 25 ppb. All patients used inhalation corticosteroids and did not use systemic corticosteroids 7 days before T0 measurement.

CONCLUSION

- ACQ-5 decreased significantly between day 0 and 7, without a difference in FEV1.
- Extended treatment was prescribed in 27.9% of the participants.
- Combined treatment response differentiates in risk for extended AAE treatment.
- The different FeNO trajectories were not related to ACQ-5 of FEV1.

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Background

Acute asthma exacerbations (AAEs) are treated with systemic corticosteroids with/without antibiotics. However, therapeutic response varies and some patients need prolonged therapy to recover.

Aim

To determine the effect of systemic AAE treatment and to relate clinical factors to treatment response.

Method

This multicentre observational study included asthma patients aged 18-70 years with an AAE. During therapy, participants performed daily Asthma Control Questionnaire 5 (ACQ-5) and spirometry. At day 7, Global Evaluation of Treatment Effectiveness (GETE) was determined. Additional treatment was defined as a new prescription of systemic corticosteroids and/or antibiotics for the AAE before the 14th day of follow-up.

Results

The preliminary analysis included 103 participants with median age of 47.0 years [IQR: 35.0–59.0]; 78.6% was female; and median BMI 28.4 [IQR: 24.5-32.9]. At day 7, 52.4% of the participants had GETE excellent/good. Additional treatment was prescribed in 25.2% of the participants; 15.5% corticosteroids, 5.8% antibiotics, and 3.9% both. ACQ-5 decreased between day 0 and 7 with median 1.2 [IQR: 0.5-2.0] ($p<0.001$). ACQ-5 decreased from day 0 to 7 in participants with additional therapy 0.6 [IQR: 0.2 – 1.4] vs. without additional therapy 1.4 [0.6 – 2.0] ($p=0.014$). Forced Expiratory Volume in the first second (FEV1) were median 2.5 l [IQR: 1.9-2.9] and median 2.5 l [IQR: 2.0-2.9] ($p=0.62$) at day 0 and 7 resp. and did not differentiate the need for additional therapy.

Conclusion

After AAE therapy, 52.4% of the participants reached GETE excellent/good. Between day 0 and 7 the ACQ-5 decreased significantly without significant difference in FEV1. Additional therapy was needed in 25.2% of the participants.