Supplementary material 1

A 1-day-visit in a severe asthma centre; effect on asthma control, QOL and healthcare use

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One-day-visit program in detail

Information requested at referral

1. Referral letter

2. Asthma-related medical correspondence of the last five years, including ENT correspondence, CT-sinus and HRCT.

3. Lung function:

   a. All LF data of the last 3 years, including FeNO

   b. Results methacholine/histamine provocation test ever

4. Laboratory: Results on total IgE, leucocytes, cell differential, RAST or skin prick test of the last 2 years

<u>At home completed questionnaires (1 day before visit):</u>

1. Patients own questions and expectations

2. Asthma control questionnaire (ACQ) (1)

3. Asthma quality of life questionnaire (AQLQ) (2)

4. Healthcare use questionnaire (HCU) (3)

5. Nijmegen hyperventilation questionnaire (4)

6. 4 dimensional symptom questionnaire (4DSQ) (5)

7. Medication list

<u>Intake specialised asthma nurse</u>

1. Welcome and introduction

2. Check at home completed questionnaires

3. Check medication list

4. Check inhalation technique

5. Assessment of compliance (ICS prescription filling ≥ 80% in previous 12 months (6) and MARS questionnaire (7))

6. Evaluate smoking history, smoke exposure at home or work

7. Assessment level of self-management

<u>Lung function department</u>

1. Length and weight

2. Exhaled NO (8)

3. Spirometry before and after 400 mcg Salbutamol (9)

4. Sputum induction (10)

Laboratory

1. Leucocytes and cell differential

2. Total IgE, RAST, specific IgEs including aspergillus

Intake pulmonologist

1. Medical history, general and asthma (using referral information) and current symptoms

2. Confirm asthma diagnosis: symptoms compatible with asthma combined with at least one of the following (previously or at intake) (11)

    a. Reversibility in FEV_1 after 400 mcg salbutamol (≥12% predicted and > 200 ml)

    b. Airway hyperresponsiveness to methacholine/histamine (PC20 < 9.8/8 mg/ml)

    c. Decrease of FEV_1 > 12% predicted at tapering of asthma medication

3. Consider alternative or overlapping diagnoses

4. Check high intensity treatment: ≥1000 mcg/day fluticasone equivalent + LABA or other controller, with or without OCS

5. Check whether asthma is uncontrolled: ≥1 out of 2

    a. ACQ ≥ 1.5

    b. ≥ 2 exacerbations previous year

    Or asthma only controlled with maintenance systemic steroids

6. Check ongoing exposition to allergens or other triggering factors

7. Check medication potentially worsening asthma

8. Check comorbidities (rhinosinusitis/nasal polyps, GER, obesity, OSAS, vocal cord dysfunction/dysfunctional breathing) by questioning and using referral information

9. Check side effects asthma medication

<u>Intake physiotherapist</u>

1. Assessment of daily activity level

2. Evaluate previous programs rehabilitation / breathing technique

3. 6-minute walking test (12)

4. Likelihood of hyperventilation/dysfunctional breathing (questionnaire and observation)

<u>Intake clinical psychologist</u>

1. Psychosocial factors potentially contributing to poor control

2. Distress, depression, anxiety, somatisation (4DSQ) or other psychological factors contributing to poor control

3. Coping

<u>Multidisciplinary team discussion</u>

1. Truly asthma?

2. Uncontrolled despite high intensity treatment? Or controlled with daily OCS

3. Contributing factors/comorbidities

4. Initial determination of asthma phenotype (based on age at onset, atopic status and presence/absence of eosinophilic inflammation)

5. Patients own questions/expectations

6. Personalised management plan (for details see online supplementary 2)

Final extensive explanatory session with the patient (by pulmonologist), focusing on

1. Is it truly/only asthma?

2. Which factors might contribute to poor control? What can be done regarding these factors

3. What subtype of asthma? Explanation and specific advices for this subtype

4. Summary of advices for patient and referring doctor

5. Patients own questions/expectations answered?

6. Referral back to own pulmonologist

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Report to the referring pulmonologist in detail (assessment and management plan)

General

1. Patient's own questions and expectations

2. Medical history, general and asthma, current symptoms

3. Medication use at intake

4. Confirmation asthma diagnosis

5. Level of asthma control and high intensity treatment

Contributing factors

1. Inhalation technique

2. Asthma education / self-management

3. Adherence

4. Alternative or overlapping diagnoses

5. Exposition to allergens or other triggering factors

6. Medication potentially worsening asthma

7. Comorbidities (rhinosinusitis/nasal polyps, GER, obesity, OSAS, vocal cord dysfunction/dysfunctional breathing)

8. Psychological factors

Symptoms and limitations

1. Asthma Control Questionnaire (ACQ) score

2. Asthma quality of life questionnaire (AQLQ) score

3. Healthcare use questionnaire (HCU)

4. Exercise tolerance: 6-minute walking test

Phenotype characteristics

1. Atopic status

2. Age-at-onset: early-onset, late-onset

3. Immunomodulatory medication use

4. Inflammatory pattern: blood, sputum, exhaled NO

5. Long function: airway obstruction, airtrapping, bronchial hyperreactivity

Conclusion

1. No/difficult-to-treat/severe asthma

2. Factors to optimize

3. Phenotypic characteristics (age-onset, atopic status, inflammation, airway obstruction)

4. Degree of quality of life and healthcare use

Personalised management plan

1. If applicable, specific advices on not yet optimised potentially contributing factors

2. Advice regarding optimalisation of current medication (increase/decrease doses of ICS or OCS, addition of extra controller medication)

3. When optimised and still uncontrolled, phenotype-specific advices regarding targeted therapies (ea. anti-IgE, maintenance OCS, anti-IL5 (trial or in future), macrolide, bronchial thermoplasty)