EXACERBATIONS OF BRONCHIAL ASTHMA: EMERGENCY CARE AT THE PRE–HOSPITAL LEVEL

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Background. Exacerbations of bronchial asthma (EBA) are defined as BA episodes, which are characterized by progressive aggravation of symptoms (shortness of breath, cough, wheezing or chest tightness) and progressive decrease of the lung function, which differ from usual patient's condition and demand changes of treatment. Risk factors of EBA include low adherence to the basic therapy, absence of intake or intake of low doses of inhalational corticosteroids (ICS), excessive intake of short–acting β–agonists (SABA), seasonal increase of allergens in the environment, concomitant diseases, unsatisfactory asthma control, psychologic and social problems, blood or sputum eosinophilia, pregnancy etc. At the clinical level EBA manifests as an increase of shortness of breath intensity, the appearance of shortness of breath at rest or/and during conversation, increase of wheezing and non–productive cough intensity, disappearance of sputum, increase of chest tightness, decrease of peak expiratory flow (PEF) after broncholytic drug intake < 60 % of proper level, increase of respiratory rate (> 30 per minute) and heart rate (> 110 beats per minute). The aims of EBA treatment include fast elimination of bronchial obstruction and hypoxemia, prevention of EBA in future. *The aim.* To characterize the emergency care in EBA on the background of actual guidelines and clinical recommendations. *Materials and methods.* The authors analyzed the main documents on this topic (Adapted clinical evidence–based guideline «BA» (2020), documents of Global Initiative for Asthma (GINA), British guidelines for management of asthma). *Results and discussion.* People with mild EBA can be treated as outpatients. During the first hour of EBA SABA must be administered (4–10 inhalations with the help of metered–dose inhaler and spacer or via nebulizer). The clinical answer must be estimated in an hour. In general, nebulization of broncholytic drugs is recommended on both prehospital and hospital levels of care. Nebulization can be provided with the help of domestic nebulizers («Yuria–Pharm»), designed for different usage conditions (UlaizerHome — home inhaler, Ulaizer First Aid — the inhaler for the ambulance, Ulaizer Pro — the inhaler for the professional usage in inpatients). There are two main tactics of nebulization administration: intermittent and continuous. Intermitteng regimen anticipates nebulization of 2.5–5 mg of salbutamol (1–2 nebulas) with an interval of 15–30 min in case of insufficient reaction on the initial treatment. In case of continuous regimen the patient needs to inhale the administrated dose via nebulizer with the speed of 10 mg of salbutamol per hour. After the first hour of treatment the needed dose of SABA varies between 4–10 inhalations every 3–4 hours to 6–10 inhalations every 1–2 hours. A repeated nebulization is an alternative choice: then the patient needs to inhale 2.5–5 mg of SABA (for instance, Nebutamol, «Yuria–Pharm») via nebulizer each 15–30 min until the clinical and instrumental parameters' improvement. If the clinical answer to the initial treatment is good (PEF>60–80 % of the proper value or of the best personal value during 3–4 hours), the additional administration of SABA is not needed. It is worth noticing that salbutamol (Nebutamol) molecule is 11.5 times more selective to the β_1–receptors of myocardium in comparison to fenoterol. This selectivity stipulates the lower risk of tachycardia. The absence of the preservative disodium edetateis an additional benefit of Nebutamol, because it was shown that

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its presence in the broncholytic solution can lead to the paradoxical narrowing of bronchi and to the decrease of treatment effectiveness. Systemic corticosteroids (SCS) speed up the EBA treatment and can be administered in cases, when the initial therapy with the help of inhalational SABA does not help to reach the prolonged improvement. The optimal daily dose of SCS is 40–50 mg of prednisolone (60–80 mg in case of ineffectiveness of the smaller dose), treatment duration must be about 5–7 days. High doses of ICS can also prevent the severe EBA development. In adult patients with acute condition worsening the administration of high doses of ICS (500–1600 mcg/day of beclometasone or 1000–2000 mcg/day of fluticasone propionate (FP) via nebulizer) during 7–14 days provides the effect similar to the short treatment by SCS. FP (Nebuflyuzon, «Yuria–Pharm») is characterized by the high affinity and the formation of prolonged connection to the appropriate receptors, which allows this drug to be a potent local anti–inflammatory agent. FP is also characterized by the excellent safety profile; it does not have systemic side effects when used in the therapeutic dosage. FP in dosage of 2000 mcg in EBA has a similar effectiveness to prednisolone in dosage of 40 mg. To sum up, nebulized treatment of EBA includes bronchospasm elimination (Nebutamol 1 nebula up to 4 times a day with the help of Ulaizer Home) and elimination of the respiratory mucosa inflammation (Nebuflyuzon ¼–1 nebula 2 times a day with the help of Ulaizer Home). We can also use Lorde hyal («Yuria–Pharm», 1 nebula 2 times a day with the help of Ulaizer Home or via intranasal administration) as an additional drug, which is able to help to eliminate sputum. *Conclusions.* 1. High adherence of patients with BA to the basic therapy is a main guaranty of prevention of exacerbations. 2. Patients with BA must be informed that the increase of the shortness of breath and wheezing, increase of asthma attacks frequency and increase of non–productive cough are the key signs of EBA. 3. Administration of SABA, including via nebulization, can be provided in the outpatients and halt the EBA progress. 4. Administration of SCS in mean therapeutic doses or of ICS in high doses significantly speeds up EBA treatment. 5. Experience of Nebutamol and Nebuflyuzon («Yuria–Pharm») usage proved their high effectiveness in EBA treatment.

Key words: exacerbation of bronchial asthma, short–acting β–agonists, corticosteroids, emergency care, nebulization.

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