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Presented by Dr. Wayne Olsheski, General Practitioner, and the University of Toronto

Answers to your questions from University of Toronto experts

Long-Acting Beta Agonists

In asthmatic patients who are using maximal doses of inhaled corticosteroids, can long-acting beta agonists be used as on-demand therapy for optimal asthma control?

The Canadian Asthma Consensus Report stated inhaled corticosteroids offer the best option for the initial anti-inflammatory therapy of asthma.[1] Once a certain dose of inhaled steroid is achieved, adding higher doses offers little additional improvement in lung function or symptom control. It does, however, increase the probability of systemic adverse effects.

In the Formoterol and Corticosteroids Establishing Therapy (FACET) International Study Group, the addition of a maintenance dose of formoterol 12 µg twice a day to either low (200 µg a day) or high (800 µg a day) doses of budesonide, resulted in significantly improved asthma control and a reduction in exacerbations when compared to increasing the dose of inhaled corticosteroids.[2]

Asthma treatment guidelines recommend long-acting inhaled beta agonists be used as maintenance therapy, and not as needed, in inadequately controlled patients with asthma using inhaled corticosteroids.

Formoterol, unlike salmeterol, has a quick onset of action similar to that of short-acting beta agonists and reverses induced bronchoconstriction rapidly. Short-term studies suggest formoterol, in doses up to 90 µg daily, has less systemic activity than terbutaline in doses up to 10 mg daily.

In a recent three-month study, the safety and efficacy of 4.5 µg inhaled formoterol was compared with 0.5 mg terbutaline, each as needed, in patients with moderate to severe asthma who were using inhaled corticosteroids.[3] The results indicated patients assigned formoterol had a longer time before the first exacerbation of asthma, compared to patients assigned terbutaline. Lung function improved to a greater extent in the formoterol group, and those patients took fewer inhalations of rescue medication. Both drugs were well-tolerated, without significant adverse events.

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In summary, formoterol, but not salmeterol, can be used on demand for optimal control of asthmatic patients who are using a maximal dose of inhaled corticosteroids. The usual recommended dose is 24 µg formoterol daily as needed. However, prolonged (more than three consecutive days) use of formoterol as a rescue medication in the range of 24 µg to 48 µg per day, may be a sign of sub-optimal asthma control and treatment should be re-assessed.

This answer was prepared by M.R. Maleki-Yazdi, MD, FRCPC, FCCP, assistant professor, respiratory medicine, University of Toronto, and active staff, *Sunnybrooke and Women's College Health Sciences Centre.*

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ECG Stress-Testing

The Duke Treadmill Score has been shown to provide accurate diagnostic information for evaluation of women with clinically suspected CHD. What is this score and how do we obtain it when requesting ECG stress-testing for women?

Electrocardiogram (ECG) treadmill testing should be performed among adults with symptoms of known or suspected coronary heart disease (CHD). It is the standard initial test used for diagnosis in both genders. Good clinical judgment, based on the description of chest pain, gender, and patient's age, should be foremost in deciding indications for exercise testing. As the pre-test likelihood of an illness influences the test result, low likelihood patients are at risk of "falsely positive" tests.[1]

In women, routine ECG stress-testing is less accurate than in men, with increased false-positive results. Reasons for this include a lower prevalence of CHD, as well as other mechanisms (*e.g.,* digoxin effect of estrogen, inappropriate catecholamine response to exercise, a different chest wall anatomy).

The Duke Treadmill Score (DTS) has been shown to provide accurate diagnostic and prognostic information in the evaluation of chest pain in women with suspected CHD and ranges from -25 (highest risk) to +15 (lowest risk).[2,3] The DTS has been shown to predict four-year survival better than clinical data alone. For patients with a high score (≥ +5), indicating low risk, the four-year survival rate was 99%, for patients

with a moderate score (+4 to -10), the rate was 95%, and for patients with low scores (< -10), the rate was 79%.[3]

The DTS is calculated using the following formula:

DTS = Exercise time (minutes) - (5 x ST deviation) - (4 x treadmill angina). ST deviation is the largest net deviation (depression or elevation in mm) and the treadmill angina is graded zero for no angina during exercise, one for non-limiting angina during exercise and two for exercise-limiting angina. A nomogram for practical application of this score can then be used.[3]

To use the DTS, ask your local stress-testing lab to either 1) provide you with the information to calculate the score when you order the test; or preferably 2) request the DTS be calculated on all patients going through the lab (computer algorithms are easily attainable and your local lab should be able to meet this request). CME

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