QUICK REFERENCE GUIDE FOR CLINICIANS

Systematic Review of the Evidence Regarding Potential Complications of Inhaled Steroid Use in Asthma

Collaboration of the American College of Chest Physicians,
the American Academy of Allergy, Asthma and Immunology, and
the American College of Allergy, Asthma and Immunology

Conclusions Based on Evidence Review:

- **Robust evidence indicates that ICS use is not associated with a clinically relevant reduction in ultimate height or bone mineral density in children. However, adults may experience significant reduction in bone mineral density with prolonged high dose inhaled corticosteroid treatment.**

- **The risk of skin thinning and easy bruising is elevated in patients receiving inhaled corticosteroids in a dose dependent fashion.**

- **Ocular complications (cataract formation, glaucoma) have not been clearly associated with inhaled corticosteroid use.**

- **The preponderance of evidence supports a conclusion that the proven efficacy of inhaled corticosteroid treatment in asthma outweighs the proven risks.**

Introduction:

Inhaled corticosteroids (ICS) are often effective in long-term control of asthma symptoms associated with airway inflammation. With alternative controller medications available, observations regarding the potential side effects of ICS therapy, have generated increasing concern and may influence asthma care discussions. However, because of the tremendous potential benefits of ICS therapy, it is important that the risks be correctly valued so that clinicians can incorporate an evidence-based approach into their therapeutic considerations. The American College of Chest Physicians, the American Academy of Asthma, Allergy, and Immunology, and the American College of Asthma Allergy, and Immunology commissioned a review of the evidence to draw conclusions regarding potential risks of inhaled corticosteroid therapy.

Systematic Review of Evidence Regarding Potential Complications of ICS in Asthma

Potential Complications in Evidence Review

- Bone Density/Osteoporosis
- Cataracts
- Glaucoma
- Growth
- Skin Thinning/Easy Bruising

Evidence Grades

Grade	Data Value	
A	S	Conclusions derived from at least two high-quality blinded RCT; may be further supported by observational studies.
B	S	Conclusions derived from more than one well-done observational study, but not confirmed by any prospective, blinded RCT.
C	S	Conclusions supported by preponderance of evidence, but high-quality conflicting evidence is available.
D	I	An association may exist and may be supported by the majority of evidence, but conflicting evidence warrants further attention.
F	__	Failed evidence review. An evidence-based conclusion cannot be derived.

[(S) indicates data sufficient to evaluate relationship between ICS and complication. (I) indicates data insufficient to evaluate relationship between ICS and complication. RCT = randomized controlled trial.]

Conclusions Based Upon Systematic Evidence Review

Bone Density/Osteoporosis

Grade	Conclusion
A	ICS use is not associated with a reduction of bone density in children with asthma.
C	Adult asthmatics generally do not sustain a significant reduction in bone mineral density in response to ICS treatment, although the effect may become clinically important in patients receiving high-dose ICS therapy for many years.

Cataract

Grade	Conclusion
C	The risk of subcapsular and nuclear cataracts associated with ICS therapy is negligible in young asthmatics; however, risk may be elevated in older patients.
F	There is insufficient information regarding differences in risk of cataract formation between various ICS formulations.
F	The dose-effect relationship between ICS use and cataract formation is poorly understood.

Glaucoma

Grade	Conclusion
F	The risk of glaucoma associated with ICS use is likely to be small; however, further study is warranted.
F	There is insufficient information regarding differences in risk of glaucoma

	between various ICS formulations.
F	There is an apparent, though poorly studied, dose-effect relationship between ICS use and glaucoma.

Growth

Grade Conclusion

A	ICS are associated with a decrease in short-term growth rates in children, but the overall effect is small and may not be sustained with long-term ICS therapy.
C	The adult height attained by asthmatic children treated with ICS is not different from that of non-asthmatic children.
C	There is insufficient information on the difference between steroid formulations in this complication to derive definitive conclusions.

Skin Thinning/Easy Bruising

Grade Conclusion

B	The risk of skin thinning and easy bruising is elevated in patients receiving ICS. Dose, duration of use, and patient gender are important variables affecting overall risk (females may be especially at risk for easy bruising).
F	There is insufficient information regarding differences in risk of skin thinning/easy bruising between various ICS formulations.
B	There is an apparent dose-effect relationship between ICS use and skin thinning/easy bruising.

Summary Conclusion

Systematic review of evidence supports a conclusion that the proven effectiveness of ICS treatment of asthma symptoms decidedly outweighs the proven risks. Clinicians may use this evidence-based review in making decisions regarding selection of treatment of asthma symptoms in individual patients.

ACCP/AAAAI/ACAAI Systematic Review of the Evidence Regarding Potential Complications of Inhaled Corticosteroid Use in Asthma

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