



Department of Internal Medicine TTUHSC - El Paso

TITLE: UPDATE ON GRAVE'S DISEASE

Presenter: Tamis Bright, MD, Associate Professor of Medicine, Chief, Division of Endocrinology, Department of Internal Medicine, TTUHSC Paul L Foster School of Medicine, El Paso, Texas

Introduction: Graves' disease is the most common cause of hyperthyroidism. Without treatment it can lead to the life threatening condition, thyroid storm.

Objectives:

- Describe the clinical presentation, evaluation, and treatment options for patients with thyroid disorders.
- Evaluate new guidelines and treatment recommendations for the management of patients with Grave's disease.

Discussion:

Graves' disease is the most common cause of hyperthyroidism with approximately 80 cases per 100,000 women per year and 8 cases per 100,000 men. Graves' disease is an autoimmune disease caused by IgG autoantibodies (thyroid stimulating immunoglobulins or TSI) to the TSH (thyroid stimulating hormone) receptor. TSI activate the receptor in the absence of TSH, resulting in increased thyroid hormone synthesis and secretion and stimulation of thyroid growth leading to goiter development. Signs and symptoms of Graves' disease include: palpitations, tremors, heat intolerance, diaphoresis, weight loss, menstrual irregularity, polyphagia, fatigue, insomnia, anxiety, proptosis, hair loss, and goiter. The thyroid status of a patient is determined by measuring TSH as it is most accurate in sensing if a patient has an appropriate level of thyroid hormone. A free T3 or free T4 level can also be helpful as in most cases the TSH is suppressed below measurable levels; improvement in free hormone levels can be used to track therapy. In a patient who does not have ophthalmopathy, which occurs only in Graves' disease, a I^{123} Thyroid Scan and Uptake is used to diagnose the cause of hyperthyroidism. Diffuse increased uptake is the hallmark of Graves'.

Graves' disease is treated with either antithyroid medication or radioactive iodine. All patients with tremors or palpitations should be given beta blockers for symptomatic relief until the thyroid levels have normalized. Women attempting to become pregnant and pregnant patients in the first trimester are treated with propylthiouracil (PTU). After the first trimester and in all other patients with glands less than or equal to about 40 grams (twice a normal size gland), methimazole is used for therapy. Methimazole is preferred over PTU because PTU has an increased risk of hepatic necrosis;

however, methimazole can cause birth defects if used during the first trimester. The risk of agranulocytosis (0.2-0.5% of patients) and other side effects are otherwise the same. PTU is also preferred in the acute phase of thyroid storm as its onset of action is slightly quicker than methimazole. However, the patient should be switched to methimazole at discharge. Patients on medication will have about a 30% spontaneous resolution of the disease in the 1st year and about 15-20% in 2nd year so can stop their medication. About 30% will have long term remission, but others will recur and need to be retreated.

In patients with larger glands, the antithyroid medications will work, however, rarely will the hyperthyroidism spontaneously resolve. Antithyroid medications do not decrease gland size. Thus, I^{131} is used to treat both the hyperthyroidism and destroy the goiter. Approximately 30% become hypothyroid after iodine therapy. All Graves' patients have a 3-5%/year incidence of hypothyroidism due production of a TSH-binding inhibitory immunoglobulin that becomes more prominent than the TSI. These block the TSH receptor without activating it, keeping TSH from binding as well.

Surgical treatment is Indicated in patients with significant side effect to PTU or methimazole who cannot receive I^{131} (pregnant patients or those who have had an iodine load from sources such as contrast or amiodarone). Sub-total thyroidectomy is usually recommended. Complications include hemorrhage, recurrent nerve palsies, hypocalcemia, and hypothyroidism.

About 25-30% of Graves' patients develop Graves' Ophthalmopathy (GO). Smoking increases the risk of GO as well as the likelihood of progression of GO after radio-iodine therapy. Men are at a higher risk than women. The risk after iodine therapy can almost eliminated by giving a 3month course of oral glucocorticoids (GC) after radioiodine therapy, and avoiding post-treatment hypothyroidism. Most ophthalmopathy resolves on own. Combination of GC (either orally or locally) with orbital radiation is more effective than either treatment alone for GO. Surgical treatment is reserved for those active GO pts that have optic nerve compromise from severe disease.

Conclusions/take home points

- Graves' disease is diagnosed with a low TSH, high FT4 or high FT3, and a diffusely increased uptake on I^{123} scan
- Methimazole (and beta blockers for symptomatic relief) is the usual therapy, except in 1st trimester pregnancy and the initial

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management of thyroid storm when PTU is preferred.

- I¹³¹ is utilized in nonpregnant patients with glands larger than 40 grams
- Smoking increases the risk of Graves' Ophthalmopathy

TITLE: EARTHQUAKES SHAKE WHICH ORGAN THE MOST?

Speaker: Ramin Tolouian, MD, Assistant Professor of Medicine, Department of Internal Medicine, Texas Tech University Health Sciences Center, El Paso

Introduction: Many victims of earthquakes develop kidney problems a few days after the event due to rhabdomyolysis leading to the crush syndrome. The percentage of patients who were registered as having renal failure after the earthquake in Marmara, Turkey and who required at least one form of renal replacement therapy has been reported to have been ~75% and mortality among patients who required dialysis has been reported at between 14 and 17.2%.

Objectives:

- Review the basic components of the Crush Syndrome
- Discuss the pathophysiology of rhabdomyolysis
- Review the basic concepts of seismo-nephrology
- Describe the use of intravenous and oral therapy in renal failure

Discussion: Ideally, patients with crush injuries should receive i.v. fluid, to induce diuresis, and possibly also bicarbonate, to maintain their urine pH in the alkaline range. Since this is frequently not feasible in the context of mass disaster using Oral solution could be a promising option.

Conclusions/take home points

- Rhabdomyolysis can be fatal.
- Hydration should be initiated as soon as possible.
- Consider oral solution as an option.
- Prior to fasciotomy, think twice.

TITLE: MEDICAL ERROR AND SAFETY OF THE BLOOD SUPPLY

Presenter: Quentin Eichbaum MD, PhD, MPH, MFA, FCAP; Department of Medical Education, Paul L. Foster School of Medicine, El Paso, Texas

Introduction: Awareness of high rates of medical error and the ensuing associated morbidity and mortality has only fairly recently been raised. How such error occurs is a mix of both technical and human error. While the focus and funding has been on introducing improvements on the technical side of error, most of the error is actually due to more readily rectifiable human/behavioral factors.

Objectives:

- Identify the common cognitive and systems errors in medical practice
- Discuss the 'technical' and 'human' root causes of medical error
- Describe the causes of error affecting safety of the blood supply
- Discuss steps taken to reduce medical error and to improve safety of transfusion practice and of the blood supply
- Explain the concept of 'hemovigilance' and how it might improve blood and transfusion safety.

Discussion: Medicine can learn from improvements in safety in the aviation industry. Improvements in safety in anesthesia were implemented both through technical and human behavioral improvements. Similarly, the safety of the blood supply was brought about through technical and such human improvements. For instance, in 1970 hepatitis technical screening and volunteer-only donors were introduced as safety improvements. However, there is still much we do not understand about error and safety issues in transfusion and blood banking. To achieve such improvements, hospitals should participate in the NIH/CDC Hemovigilance programs.

Conclusions/take home points:

- Medical error is due to both technical and human behavioral factors; to improve safety we need to act on both fronts
- The safety transfusion and of the blood supply could be improved by participating in hemovigilance network program.

TITLE: ORAL ANTICOAGULANTS: PAST, PRESENT, AND FUTURE

Presenter: Dale Quest, PhD, Associate Professor of Medicine, Paul L Foster School of Medicine, Department of Medical Education

Introduction: Presentation of this topic coincides with FDA approval of the oral direct thrombin inhibitor, dabigatran, for prevention of stroke in atrial fibrillation, based on the results of the RE-LY trial in which warfarin was an active comparator. An analogous trial called ROCKET-AF that also pitted an oral direct Xa inhibitor, rivaroxiban against warfarin has recently been completed. It is one of two oral direct Xa inhibitors currently awaiting market authorization by the FDA; still more in development. Prior to completion of RE-LY and ROCKET-AF in late 2008, dabigatran and rivaroxiban both obtained regulatory Notice of Compliance in Canada for prevention of Venous Thrombotic Events in patients undergoing total hip or total knee replacement. An expert advisory committee considered both drugs for that indication and subsequently turned down dabigatran, but recommended rivaroxaban. Without that recommendation, a drug will have no market in Canada. With the results of RE-LY and ROCKET-AF in hand, Boehringer and Bayer are back in their respective queue for prevention of stroke in patients with AF in Canada, while dabigatran is already working aggressively to gain market share over warfarin for that indication here in the United States.

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