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Severe to Very Severe Hypertriglyceridemia Management

INTRODUCTION

Patients admitted with severe to very severe hypertriglyceridemia (HTG) are at risk of developing acute pancreatitis

(Esparza et al., 2019; Frankova et al., 2019; Garg & Rustagi, 2018; Gelrud & Whitcomb, 2021; He et al., 2020; Sezgin et al., 2019; Thuzar et al., 2014; Uyar et al., 2017; Yildirim et al., 2019).

Third most common cause of pancreatitis is HTG, accounting for up to 14% of cases in reviewed literature

(Frankova et al., 2019; Gelrud & Whitcomb, 2021; Thuzar et al., 2014; Yildirim et al., 2019)

Terminology:

- Severe HTG- triglyceride level of 1000-1999 mg/dL
- Very Severe HTG- triglyceride level ≥2000 mg/dL

(Gelrud & Whitcomb, 2021)

Pathogenesis of HTG induced acute pancreatitis (IAP):

- Happens when free fatty acids produced by the breakdown of triglycerides cause lipotoxicity and an inflammatory response

(Gelrud & Whitcomb, 2021)

Diagnosis:

- 2 of 3 findings must be present- abdominal pain, serum pancreatic enzymes at least 3x normal level, & imaging revealing pancreatitis (Garg & Rustagi, 2018; Gelrud & Whitcomb, 2021; Sezgin et al., 2019)

Background

- At an Intensive Care Unit (ICU) in Texas, United States, nursing anecdotally observed an increase in patients diagnosed with HTG requiring insulin therapy
- No current specific protocol & policy for managing patients with severe to very severe HTG was available per hospital
- Investigators sought to answer the question, "In adults (>18 of age) with severe to very severe HTG-IAP, what evidence-based treatment in addition to continuous insulin therapy should be employed during inpatient hospitalization?"

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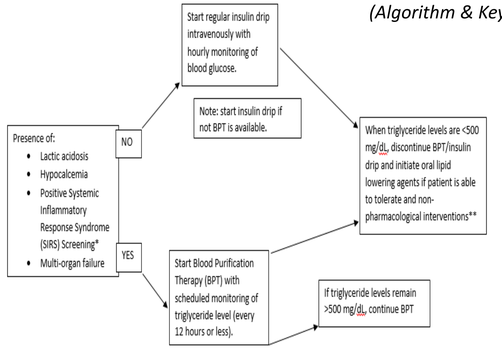
Methods

- Literature review search completed April 8, 2021
- Search terms: "hospitalized" AND "adult" AND "hypertriglyceridemia" AND "management" AND "insulin" (3,130 results)
- Current (<5 years) literature search through 2021 limited to English yielded 759 peer-reviewed publications.
- Once screened for relevancy by title (n=17), abstracts (n=8), and full text (n=7).
- Three additional articles were identified through snowballing information in UpToDate and ClinicalKey, for a final sample of ten manuscripts.
- Synthesis of findings was facilitated using a research table for documentation of key findings and discussion.
- Level of Evidence: Level 1 (n=1), Level 2 (n=1), Level 4 (n=2), Level 6 (n=5), Level 7 (n=1)

Suggested hypertriglyceridemia algorithm



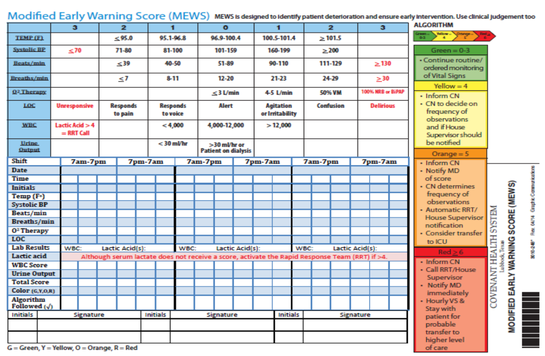
(Algorithm & Key adapted from UpToDate, 2021)

Worsening inflammation signs can include:

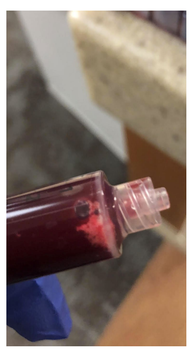
*Modified Early Warning Score Tool positive findings- elevated respiratory rate, WBC abnormal, hypotension, tachycardia, and other abnormal findings (Roney et al., 2015).

**Non-pharmacologic interventions include: diet, weight loss, exercise, and blood sugar control (Gelrud & Whitcomb, 2021).

MEWS Tool utilized at Covenant Health



Lipid in Blood Sample



RESULTS

Multiple causes include pregnancy, alcoholism, obesity, specific drugs, especially diabetes mellitus

(Esparza et al., 2019; Magradze & Shelestova, 2018; Gelrud & Whitcomb, 2021; Thuzar et al., 2014)

No significant difference in patients who received intravenous insulin therapy (IT) versus blood purification therapy (BPT)

(Frankova et al., 2019; Garg & Rustagi, 2018; Gelrud & Whitcomb, 2021; He et al., 2020; Sezgin et al., 2019; Yildirim et al., 2019)

Treatment goal of triglyceride level <500 mg/dL

(Esparza et al., 2019; Frankova et al., 2019; Garg & Rustagi, 2018; Gelrud & Whitcomb, 2021; He et al., 2020; Sezgin et al., 2019; Thuzar et al., 2014; Uyar et al., 2017; Yildirim et al., 2019)

Once treatment goal met, recommendation to start fibrates, niacin, omega 3 fatty acid, and statins

(Garg & Rustagi, 2018; Gelrud & Whitcomb, 2021; Magradze & Shelestova, 2018; Sezgin et al., 2019)

Recommendation to initiate BPT with organ dysfunction

(Uyar et al., 2017; Gelrud & Whitcomb, 2021)

IT with fasting seen in one study to significantly reduce triglyceride level compared to use of IT without fasting

(He et al., 2020; Thuzar et al., 2014)

IMPLICATIONS FOR PRACTICE

- Strong foundational comprehension of HTG-IAP care interventions enables care providers to advocate for evidence-based treatment interventions.
- Having these interventions initiated rapidly through the development of protocols and order sets ensures reliable treatment for the best outcomes.
- Additional research to evaluate IT, BPT, and lipid-lowering medications' efficacy for HTG-IAP evidence-based treatment management strategies should be studied further.

CONCLUSION

- Answering the question of HTG-IAP treatment with IT and/or BPT was supported with limited evidence in peer-reviewed literature
- Nurses applying evidence-based management options for HTG-IAP in hospitalized patients may ensure reduced adverse outcomes
- Evidence-based treatment strategies must be readily accessible at the point of care delivery in easy-to-apply formats such as protocols and order sets