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INTRODUCTION

The hepatobiliary iminodiacetic acid (HIDA) scan is a nuclear medicine technique used in the work-up of biliary pain involving the use of radioactive tracers to assess the function of the gallbladder. [1]

The gallbladder ejection fraction (**GBEF**) indicates the percentage of tracer leaving the gallbladder following administration of a contractility agent; it is often reduced in biliary disease, reflecting suboptimal gallbladder function.[2]
The cutoff for normal GBEF varies across studies but is often **~38-40%** regardless of HIDA protocol.[2,3]

Various protocols of HIDA scanning exist to stimulate gallbladder contraction, including the use of:
Sincalide (cholecystokinin (CCK) analogue)) *(Protocol 1)*;
Ensure *(Protocol 2)*;
Fatty meal administered orally *(Protocol 3)*.[4,5]

**Note: At the study's institution, imaging occurred at the 30-minute mark in Protocol 1, and at the 60-minute mark in Protocols 2 and 3.*

METHODS

A retrospective chart review was conducted (HREB ref. #20240629) using pre-existing data from a parent study by Kerr et al. (2024), including patients with **abdominal pain** & **normal ultrasound** findings who had **abnormal HIDA** scans (GBEF ≤40%) at a single institution from Jan. 2018 – Dec. 2022 **(N=525).**

318 patients underwent *Protocol 1* (60.6%);
175 patients underwent *Protocol 2* (33.3%);
32 patients underwent *Protocol 3* (6.10%).

Statistical analysis was performed via **R** using one-way Analysis of Variance, Chi-square tests of independence, and Fisher's exact tests to compare dependent variables across protocols. Post-hoc testing was conducted for statistically significant outputs.

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RESULTS

Normal HIDA Scan



71-year-old female with painless thickening of the gallbladder wall on U/S.
Delayed images via HIDA Protocol 1 (sincalide) show a normal GBEF of 100%.

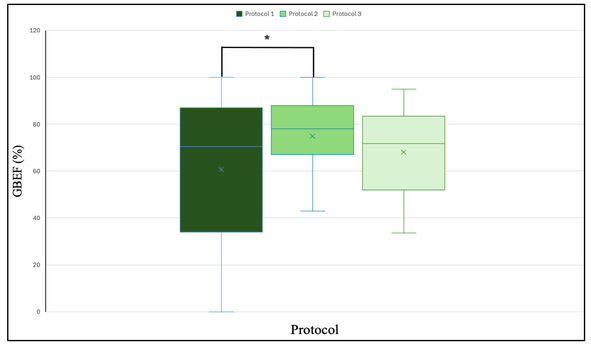
Abnormal HIDA Scan



52-year-old male with chronic intermittent RUQ pain & normal U/S findings.
Delayed images via HIDA Protocol 1 (sincalide) show non-filling of the gallbladder with a GBEF of 28%.

Main Clinical Findings

GBEF vs. Protocol



Protocol 1 (sincalide) had significantly **lower GBEF** values (%) than Protocol 2 (Ensure); p<0.001*.

Surgical Interventions (%) vs. Protocol

Protocol 1 (sincalide) had significantly **more surgical interventions** (%) via cholecystectomy than Protocol 2 (Ensure); p<0.01*.

Final pathology **did not** differ significantly across protocols (p=0.485).

Symptom Resolution (%) vs. Protocol

No significant differences were observed in reported resolution of symptoms/pain at subsequent appointments by patients with follow-up data available; p=0.839.

*Patients **did not** differ significantly regarding age, sex, smoking, alcohol use, or comorbidities (all p-values >0.05).*

CONCLUSIONS

GBEF values differed across protocols, which is a contrasting finding to the existing literature.[6,7] Thus, the HIDA protocol used may in fact influence GBEF values.

Regardless of the HIDA protocol used, patients' **clinical outcomes at long-term follow-up did not significantly differ.** This suggests that the use of Ensure or a fatty meal administered orally may serve as **substitutions** for the use of sincalide if necessary.
However, the use of sincalide (Protocol 1) remains **the gold standard** method.

Protocol 1 GBEF values showed much more **variability** than Protocols 2 and 3, which at the study's institution, used imaging at the 30-minute mark rather than the 60-minute mark.
Imaging at the **60-minute mark** is therefore recommended by these results.

Future **randomized controlled trials** and reviews with **larger populations** on this topic would be beneficial to help further elucidate these ideas.

FURTHER INFORMATION

For any questions or comments regarding this study, please email the primary investigator (PI) at **acehodder@mun.ca.**