

Impact of Metabolic Syndrome on the Perioperative Outcomes of Emergency General Surgical Patients

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BACKGROUND

- ❖ Metabolic Syndrome (MetS) is a constellation of cardiovascular risk factors including central obesity, hypertension, hyperglycaemia, hypertriglyceridaemia (hyper-TG) and hypo-HDL-cholesterolaemia (HDL-c).^a
- ❖ MetS is a significant public health issue due to its rising prevalence and its strong association with a myriad of chronic diseases.^b
- ❖ Greater prevalence of MetS is reported in the surgical population compared to the general public and have been associated with a significant risk of perioperative complications in the elective surgical patients.^c
- ❖ **Aim:** To evaluate the impact of MetS and its individual components on the perioperative outcomes and the use of hospital resources in patients who receive emergency general surgery (EGS).

METHOD

- ❖ **Study Design:** Prospective observational cohort study
 - Patients receiving EGS at The Northern Hospital between March 2019 to March 2020.
- ❖ **MetS Diagnosis:** Modified IDF-AHA/NHLBI criteria.^a
 - Modification: BMI and HbA1c was used instead of waist circumference and fasting BSL respectively.
- ❖ **Data collection:** Over the 30-day post-operative period.
 - Demographic, medical history and perioperative outcomes were collected from the medical records.
 - Severity of the complication was assigned using the Clavien-Dindo classification system (CD).^d
 - Peripheral blood (HbA1c & Lipids), BMI and blood pressure were taken during the admission.
- ❖ **Data Analysis:** Univariate and multivariate analysis using chi square and binary logistic regression models (IBM SPSS Statistics v.26.0).

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RESULTS

- ❖ There were 230 participants, 140 in the control group and 90 in the MetS group (Figure 1).
- ❖ The majority of the participants had at least 1 MetS component (Figure 2).

Figure 1. Study population: Control vs. MetS

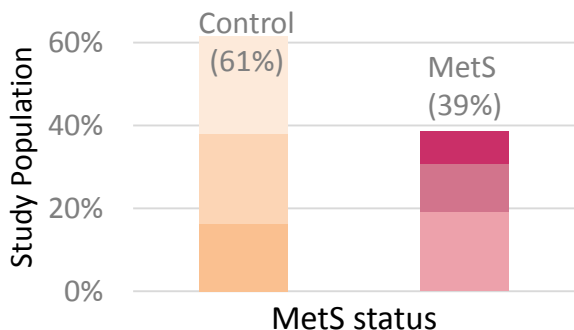
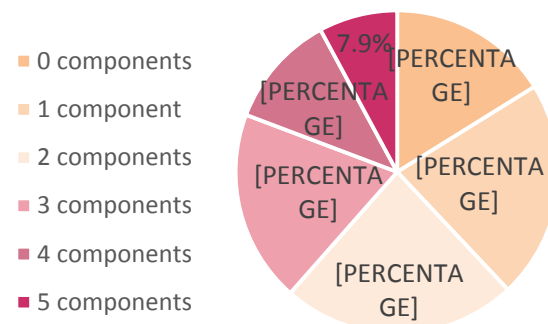


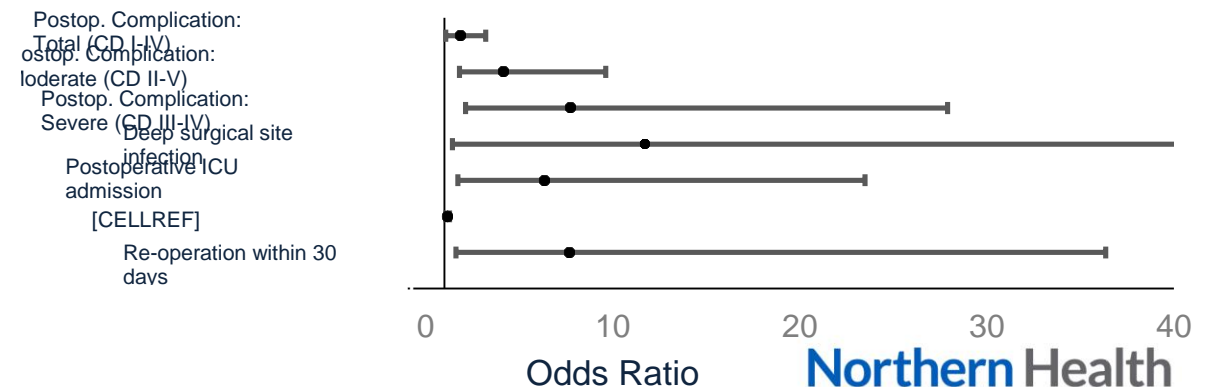
Figure 2. Number of MetS Components in the Study Population



- ❖ Participants underwent 13 different types of major and minor procedures. Similar proportion of each cohorts received major procedure: MetS (56%) vs. control (50%)
- ❖ The MetS cohort were more likely to be >60yo, male, higher ASA grade and have comorbidities such as CAD, COPD and cancer.

- ❖ On univariate analysis, the MetS cohort had significantly higher odds of postoperative complications, especially with those of greater severity (CD II-IV, CD III-IV; Figure 3).
 - There were no mortality reported in either cohorts.
 - MetS significantly increased the use of hospital resources such as longer duration of hospitalisation.
 - There were no significant relationship between MetS and complications of specific organ systems such as myocardial infarction and pulmonary embolus.

Figure 3. The Impact of MetS on Postoperative complications



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RESULTS (Continued.)

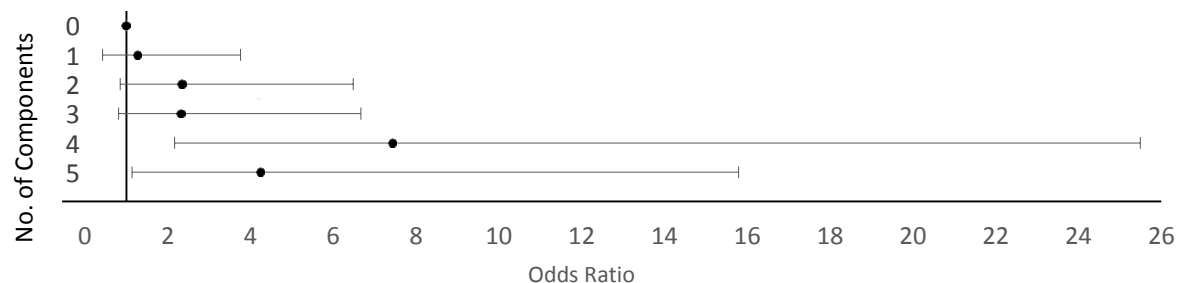
- ❖ Individual components of MetS conferred varying degrees of impact on the perioperative outcomes.
 - Hypertension, hyperglycaemia and hyper-TG were significantly associated with major postoperative complications (CD III-IV).
 - The uncontrolled hyperglycaemia and hypertension were associated with higher odds of adverse events compared to those with controlled diseases.
 - There was a cumulative impact of individual MetS components on the risk of moderate postoperative complication (CD II-IV; Figure 4).

- ❖ Upon adjustment for the confounding variables, MetS (OR 5.21, $P < 0.05$) and hyperglycaemia (OR 4.45, $P < 0.05$) were significantly associated with major postoperative complications (CD III-IV).

DISCUSSION & CONCLUSION

- ❖ The MetS cohort demonstrated a significantly increased risk of perioperative complication, especially those of greater severity, and the use of the hospital resources.
- ❖ Therefore, MetS and its individual components should be optimised in the perioperative period to reduce the likelihood of adverse outcomes.
- ❖ Furthermore, these findings may pose implications for the prioritisation of patients receiving EGS.

Figure 4. Association between the Number of MetS components and Moderate Postoperative complication (CDII-IV)



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