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CÁPSULA ENDOSCÓPICA

Comparing grading systems to assess the quality of small bowel preparation in capsule endoscopy: CAC score and subjective scales

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Introduction and Aim

Capsule endoscopy enables the non-invasive visualization of the small bowel (SB).



Diagnostic yield is negatively influenced by intestinal residue.



Validated scales to assess the quality of cleansing are scarce, especially objective ones.



We aim to compare the Computed Assessment of Cleansing (CAC) score by Van Weyenberg with the subjective scale by Brotz.



Methods

30 consecutive SB capsules (Pillcam™ SB3, Medtronic, USA)

Performed in our department

Complete enteroscopy

After ingestion of 2L of PEG solution the day before and simethicone at the beginning of the exam



1:00

2:00

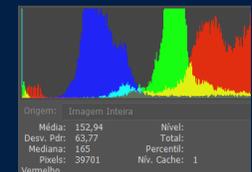
3:00

4:00

Acquired the tissue color bar referring to the SB

Using the histogram option on Adobe Photoshop® calculated the CAC score = $[(\text{Red} / \text{Green mean intensity value}) - 1] \times 10$

Compared to weak to excellent and adequate or inadequate



Results

17 men (56.7%)
Median age 68 years (8-88)
18 outpatients (60%)
17 requested by a
Gastroenterologist (56.7%)
In 13 indication was chronic
iron-deficiency anemia (43.3%)
18 had pathological findings (60%)

Overall Assessment of Intestinal
Preparation:

Inadequate – 7 (23.3%)
Adequate – 23 (76.7%)

Qualitative evaluation:

Weak – 7 (23.3%)
Reasonable – 16 (53.3%)
Good – 7 (23.3%)
Excellent – 0

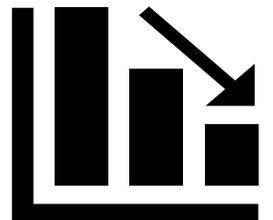
CAC score
Median value of 4.43
Varied between 2.52 and 6.43

We found a significant
association between
inadequate intestinal
preparation and older
age (p=0.003)



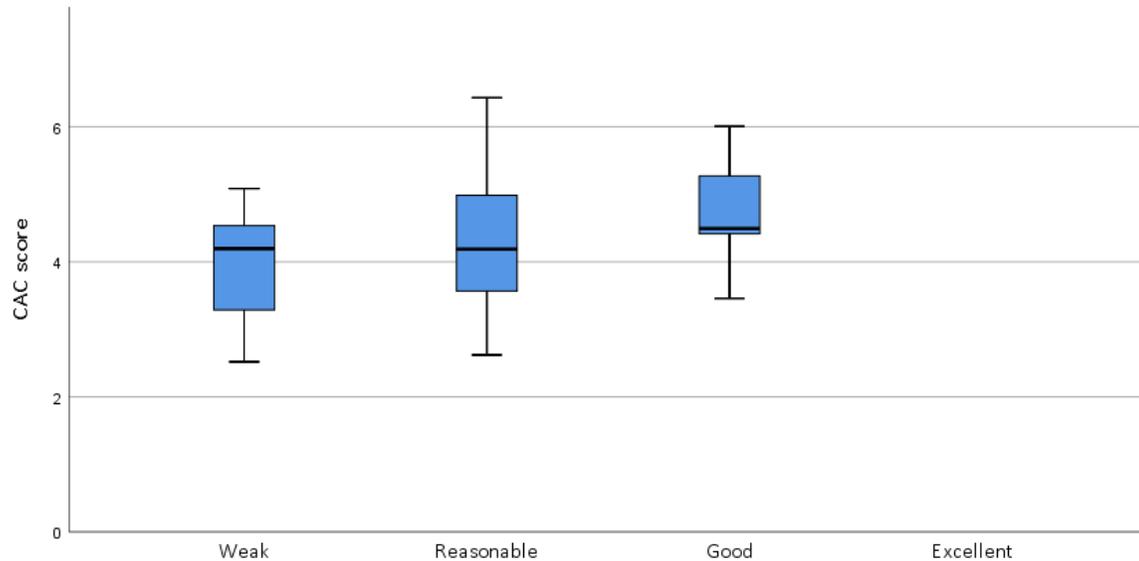
Significant negative correlation between
CAC score and age (rs=-0.39, p=0.035)
CAC score and intestinal transit time
(rs=-0.47, p=0.009)

but it was not significantly
associated with patient
setting, gender, requisitioner,
indication or findings

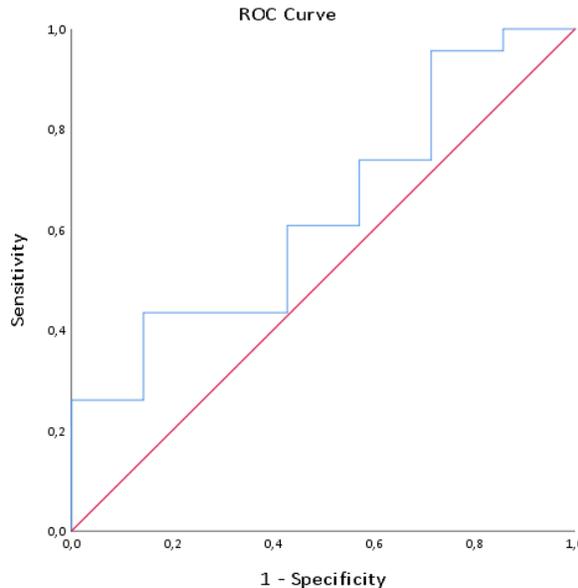


Results

CAC score and qualitative evaluation of intestinal preparation



Graph. 1: CAC score and qualitative evaluation of intestinal preparation boxplot.



Graph. 2: CAC score and overall assessment of intestinal preparation ROC curve.

CAC score and overall assessment
AUROC 0.634
95%CI [0.403;0.864]
p=0.292

The computed score and the quantitative index from weak to excellent were not significantly associated ($r_s=0.231$, $p=0.219$)

When dividing the tissue bar in 3 equal segments, the mean red/green ratio progressively decreased

In 6 out of 7 inadequate overall intestinal preparations, the ratio red/green was ≤ 1.5 (not statistically significant)

The 2nd segment showed a better performance when comparing with adequate/inadequate evaluation AUROC 0.702, 95%CI [0.489;0.915], $p=0.111$

Conclusion

Although reported as feasible and reproducible, our data found no significant correlation between CAC score by Van Weyenberg and subjective scale by Brotz, achieving an average accuracy of 63.4% in SB preparation quality assessment.

References

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- Ponte A, Pinho R, Rodrigues A, Carvalho J. Review of small-bowel cleansing scales in capsule endoscopy: A panoply of choices. *World J Gastrointest Endosc* 2016;8(17):600-609
- Van Weyenberg SJB, De Leest HTJI, Mulder CJJ. Description of a novel grading system to assess the quality of bowel preparation in video capsule endoscopy. *Endoscopy* 2011;43:406–411