Impact of N-Butylscopolamine on 18F-FDG Bowel Uptake in Type 2 Diabetes Patients Treated with Metformin

D Bellemare, MD; J Gauthier, MD; E St-Jean-Dumais, MD; A Asatryan, MD; J Beauregard, MD, MSc

Department of Radiology, Université Laval and Department of Medical Imaging, CHU de Québec, Quebec City, Quebec, Canada

PLAN

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DISCLOSURE

- J Beauregard was invited speaker for Siemens in 2014 (fees received).
- The other authors report no conflicts of interest in this work.

OBJECTIVES

- Increased bowel uptake of 18F-fluorodeoxyglucose (FDG) in diabetic patients treated with metformin may result in decreased diagnostic accuracy of positron emission tomography (PET), particularly for detection of bowel lesions.

OBJECTIVES

- N-butylscopolamine (Buscopan) is used in many institution to decrease physiological bowel uptake and improve bowel evaluation.

- We aimed to investigate the influence of N-butylscopolamine on 18F-FDG bowel uptake specifically in diabetic patients treated with metformin.

MATERIAL AND METHOD

- Study design
  - Retrospective study
- Material
  - PET-CT
    - Siemens Biograph 6 PET/CT scanner
  - Workstation
    - Siemens Syngo MI Apps workstation

MATERIAL AND METHOD

- Study group
  - Patients were all imaged by whole-body FDG-PET/CT for an oncologic indication, between 2009 and 2013.
  - Medical record of 657 patients who received N-butylscopolamine as a pre-medication were reviewed.
- Control Group
  - A randomly selected sample of 380 patients imaged by FDG-PET/CT for an oncologic indication during the same period were reviewed.

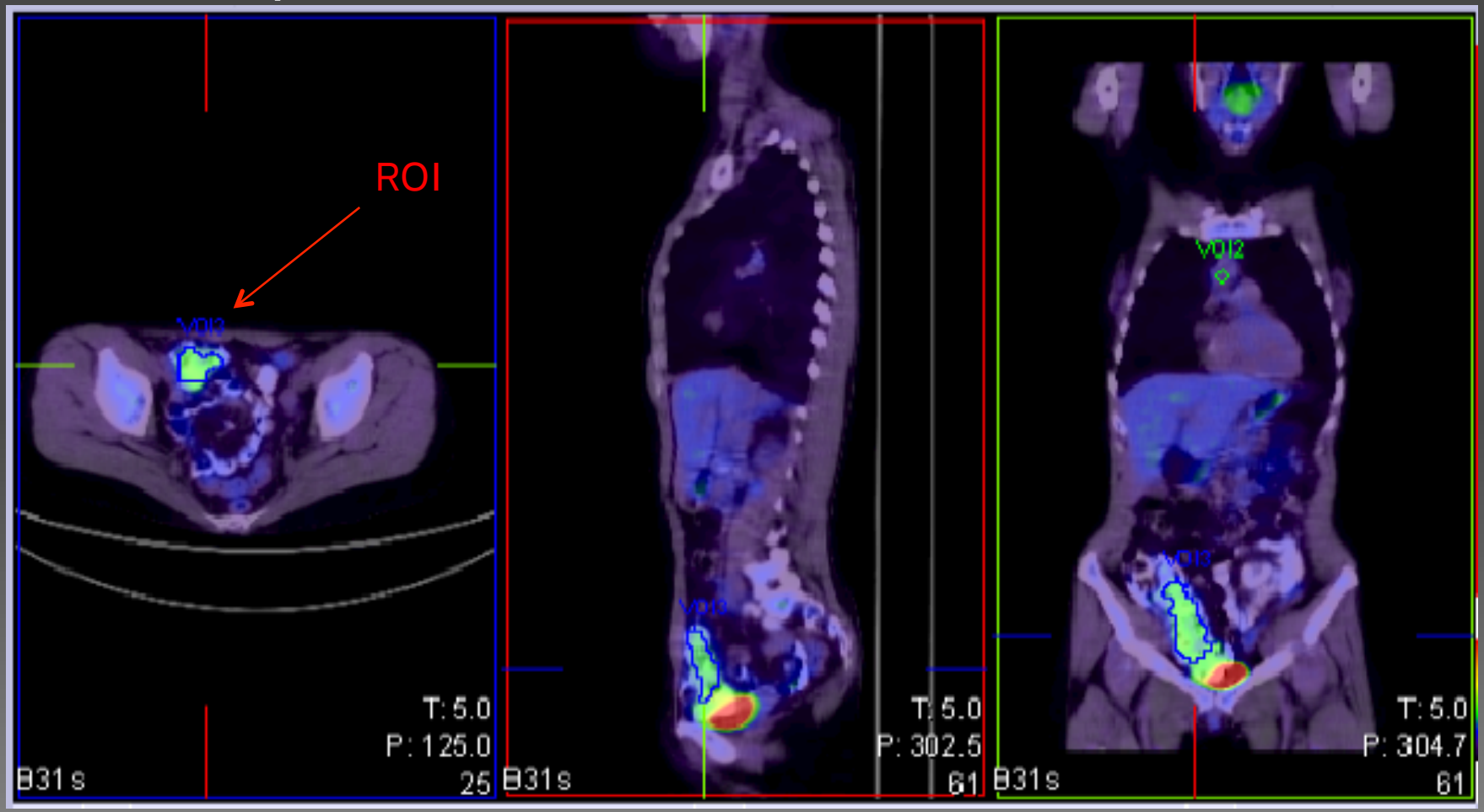
MATERIAL AND METHOD

- Medical records were reviewed by radiology residents for details concerning:
  - Demographic datas
  - Metformin intake
  - Dosage and route of administration of N-butylscopolamine
    - Either 10mg IM, 20mg IM, 10 mg IV or 20 mg IV

MATERIAL AND METHOD

- FDG-PET/CT were reviewed by four radiology residents
  - Area of maximal bowel uptake was localized visually, region of interest (ROI) was outlined and assessed using maximum standardized uptake value (SUVmax).
  - Inter-observer variability was assessed by intraclass correlation coefficient.
    - ICC was .996 with a 95% confidence interval from .998 to 1.000.

- Example of SUV assessment



RESULTS

- Study group
  - 657 patients received N-butylscopolamine as a pre-medication.
  - Among these, 107 patients had diabetes.
  - 33 patients with diabetes for whom metformin intake was documented were identified.
    - Mean age: 67 years old
    - 25♂ and 8♀

RESULTS

- Control Group
  - 380 patients were reviewed.
  - 123 patients had diabetes.
  - 13 diabetic patients with confirmed metformin intake who did not received N-butylscopolamine as pre-medication were identified.
    - Mean age: 71 years old
    - 9♂ and 4♀

RESULTS

- Study group
  - Mean SUVmax: 10.3 ± 4.4 SD
    - Range: 2.8 to 21.7
- Control group
  - Mean SUVmax: 11.8 ± 5.4 SD
    - Range: 4.97 to 24.70
- A One-Way ANOVA between these two groups was not statistically different ($p=0.1793$)

DISCUSSION

- Among diabetic patients treated with metformin, 33 received N-butylscopolamine and 13 did not.
- Average bowel SUVmax in these 2 groups was 10.3 ± 4.4 and 11.8 ± 5.4 SD, respectively.
- There is a 12.8% difference in bowel uptake between those two groups.

DISCUSSION

- One-way ANOVA analysis is not statistically different ($p=0.1793$) and did not appear clinically significant, as bowel uptake remained nearly as intense in metfomin-treated diabetic patients who received N-butylscopolamine, as compared to those who did not.

CONCLUSION

- The results of our study suggest that there is no significant impact of N-butylscopolamine administration on 18F-FDG bowel uptake in diabetic patients treated with metformin.
- N-butylscopolamine seems to have little potential to improve FDG-PET/CT accuracy in this patient population.

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