DIAGNOSTIC ACCURACY OF CAPSULE ENDOSCOPY READING ASSISTED BY ARTIFICIAL INTELLIGENCE FOR EXPERT READERS: INTERIM ANALYSIS OF A SINGLE CENTER EXPERIENCE

Author Block: *Stefania Piccirelli[1,2], Alessandra Bizzotto[1], Eugenia Vittoria Pesatori[1,2], Daniele Salvi[1,2], Enrico Tettoni[1,2], Nicoletta Belluardo[1,2], Cristiano Spada[1,2]*
[1]Fondazione Poliambulanza Istituto Ospedaliero, Brescia, Lombardia, Italy; [2]Fondazione Policlinico Universitario Agostino Gemelli IRCCS, Roma, Lazio, Italy;

Abstract Body

BACKGROUND AND AIMS: Artificial Intelligence (AI) promises to revolutionize the field of capsule endoscopy by reducing reading time while maintaining high diagnostic accuracy. Preliminary results show that Convoluted Neural Network (CNN)-based algorithms demonstrate promising diagnostic accuracy in detection of small bowel lesions with relevant reduction of reading time. Primary aim of this study was to compare the diagnostic accuracy of AI-assisted reading with standard reading, when both are performed by expert readers (>500 cases), in detection of significant pathology of the small bowel. Secondary aim was to compare mean reading time of both reading modalities.

METHODS: A consecutive series of 20 patients who performed Small Bowel Capsule Endoscopy (SBCE) (Navicam, Ankon, China) from July to November 2021 at Fondazione Poliambulanza Hospital was prospectively enrolled. All capsule examinations were evaluated by an expert reader according to the standard of care (i.e. ESGE standards). A second blinded expert reader reviewed all videos in the "AI-assisted" modality. In case of discordant results between AI and Standard Reading (SR) a panel of experts was used to resolve the discrepancies. Main diagnoses (suspected SB neoplasia or high potential bleeding lesions -P2 lesions using Saurin classification) reported by each reader were compared, considering SR as gold standard. Mean reading time of the two readers was also measured and compared.

RESULTS: Of 20 patients (7 males, mean age 69 ± 12) who underwent SBCE, 19 patients had a complete SB examination and were included in the interim per-patient analysis (in 1 patient the capsule remained in the stomach for the entire recording). Both standard and AI-assisted readings detected small bowel pathology in 15 patients while 4 patients had negative examination, with an overall match of main diagnoses reported by two readers. Sensitivity, specificity, positive and negative predictive values of AI-based reading compared to SR were 100%. Mean SB reading time in SR and AI-assisted modality were 41.25 min ± 14.14 and 4.75 ± 2.86 min, respectively (p<0.0000001)

CONCLUSION: AI-assisted CE reading showed 100% diagnostic accuracy in detection of significant small bowel pathology with a significant reduction of reading time.