

# Comparative analysis of diagnostic scales of acute appendicitis: Alvarado, RIPASA, and AIR

*Análisis comparativo de escalas diagnósticas de apendicitis aguda: Alvarado, RIPASA y AIR*

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Dear editor,

We have carefully read the article *Comparative analysis of diagnostic scales of acute appendicitis: Alvarado, RIPASA, and AIR*, published by Bolívar-Rodríguez et al.<sup>1</sup> regarding the use of these three predictive scales for the diagnosis of acute appendicitis, a highly frequent surgical disease in hospital emergency departments all over the world. We consider important the study of the scales that aid acute appendicitis diagnosis and decision-making for the corresponding surgical intervention, but the extremely high sensitivity values for the Alvarado scale (97.2%) attracted our attention, given that in some reviewed studies, these values range between 58.9% and 82.8%, and specificity values, between 85.7% and

100%<sup>2-4</sup>. Therefore, we decided to reconstruct the contingency tables with the information referred in the study and recalculated the sensitivity and specificity values, with different figures being obtained for the Alvarado and AIR scales; the values for the RIPASA scale did coincide (Table 1).

Probably, there is a calculation error, unless the cutoff points are different from those described in the literature, which are 7 for Alvarado, 7.5 for RIPASA, and 5 for AIR<sup>5,6</sup>.

## Conflicts of interest

The authors declare not having any type of conflicts of interest.

**Table 1. Comparison between the results obtained by the authors and the original figures published by Bolívar-Rodríguez et al.<sup>1</sup>**

| Results              | Scales   | Sensitivity % (95% CI) | Specificity % (95% CI) | PPV % (95% CI)   | NPV % (95% CI)   |
|----------------------|----------|------------------------|------------------------|------------------|------------------|
| Bolívar-Rodríguez    | Alvarado | 97.2 (92.1-99.1)       | 27.6 (14.7-45.7)       | 83.3 (75.9-88.8) | 72.7 (43.4-90.3) |
|                      | RIPASA   | 97.2 (92.1-99.1)       | 27.6 (14.7-45.7)       | 83.3 (75.9-88.8) | 72.7 (43.4-90.3) |
|                      | AIR      | 91.9 (71.5-99.1)       | 89.5 (68.6-97.1)       | 96.7 (88.8-99.1) | 56.7 (39.2-72.6) |
| Caballero and Rebaza | Alvarado | 77.8 (68.6-85)         | 44.8 (27-64)           | 84 (75-90.3)     | 35.1 (20.7-52.6) |
|                      | RIPASA   | 97.2 (91.5-99.3)       | 27.6 (13.5-47.5)       | 83.3 (75.4-89.2) | 72.7 (39.3-92.7) |
|                      | AIR      | 81.4 (70-89.4)         | 57.9 (34-78.9)         | 87.7 (76.6-94.2) | 45.8 (26.2-66.8) |

CI: confidence interval; NPV: negative predictive value; PPV: positive predictive value.

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## References

1. Bolívar-Rodríguez MA, Osuna-Wong BA, Calderón-Alvarado AB, Matus-Rojas J, Dehesa-López E, Perza-Garay FJ. Análisis comparativo de escalas diagnósticas de apendicitis aguda: Alvarado, RIPASA y AIR. *Cir Cir*. 2018;86(2):169-74.
2. Nanjundaiah N, Mohammed A, Shanbhag V, Ashfaq K, Priya SA. A comparative study of RIPASA score and ALVARADO score in the diagnosis of acute appendicitis. *J Clin Diagn Res*. 2014;8:NC03-5.
3. Chong CF, Thien A, Mackie AJ, Tin AS, Tripathi S, Ahmad MA, et al. Comparison of RIPASA and Alvarado scores for the diagnosis of acute appendicitis. *Singapore Med J*. 2011;52:340-5.
4. Karami MY, Niakan H, Zadebagheri N, Mardani P, Shayan Z, Deilami I. Which one is better? Comparison of the Acute Inflammatory Response, Raja Isteri Pengiran Anak Saleha Appendicitis and Alvarado Scoring Systems. *Ann Coloproctology*. 2017;33:227-31.
5. Erdem H, Çetinkünar S, Daş K, Reyhan E, Değer C, Aziret M, et al. Alvarado, Eskelinen, Ohlmann and Raja Isteri Pengiran Anak Saleha Appendicitis scores for diagnosis of acute appendicitis. *World J Gastroenterol*. 2013;19:9057-62.
6. de Castro SMM, Ünlü C, Steller EP, van Wagenveld BA, Vrouwenraets BC. Evaluation of the appendicitis inflammatory response score for patients with acute appendicitis. *World J Surg*. 2012;36:1540-5.