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BACKGROUND

The indirect immunofluorescence assay on HEp-2 cells (HEp-2 IFA) remains the gold standard for autoantibody screening, offering insights into potential autoantibodies and guiding further testing based on specific clinically relevant patterns. To promote harmonization in testing and reporting, the Brazilian Consensus on Antinuclear Antibodies (BCA HEp-2), established in 2000, and the International Consensus on ANA Patterns (ICAP), initiated in 2014, collaborate to standardize HEp-2 IFA pattern nomenclature and definitions.

AIM

To assess Brazilian laboratories' ability to classify common HEp-2 IFA patterns following BCA and ICAP guidelines.

METHODS

In phase one, serum samples exhibiting six competent-level patterns were sent to 64 laboratories, and accuracy rates were calculated based on the correct identification of the expected patterns. Phase two evaluated image recognition accuracy for 22 additional patterns, with accuracy expressed as percentages. All patterns were reported using the alphanumeric code (AC) defined by ICAP (www.anapatterns.org).

RESULTS

Negative HEp-2 IFA samples (AC-0) were correctly identified by 95.2% of participants. Positive sample accuracy rates varied: AC-1 (66.4%), AC-2/30 (61.4%), AC-3 (94.1%), AC-4/5/31 (94.6%), and AC-8/9/10 (86.7%) (Figure 1). Expert-level image recognition averaged 69.7%, with specific rates of 77.1% (nuclear), 82.4% (nucleolar), 72.2% (cytoplasmic), and 67.3% (mitotic). Accuracy for individual patterns ranged widely: AC-1 (93.5%), quasi-homogeneous (QH) nuclear (50.0%), AC-2 (88.5%), AC-3 (98.1%), AC-4 (94.8%), AC-5 (84.8%), AC-6 (96.6%), AC-7 (78.8%), AC-8 (96.5%), AC-9 (68.3%), AC-12 (58.5%), AC-13 (83.1%), AC-14 (20.0%), AC-19 (72.1%), AC-20 (36.7%), AC-21 (85.2%), AC-23 (95.0%), AC-25 (69.4%), AC-26 (45.5%), AC-27 (86.9%), and AC-29 (62.0%) (Figure 2).

CONCLUSIONS

Laboratories performed well with AC-0 and achieved high accuracy for most competent-level patterns. However, nuclear patterns with positive metaphase plates (AC-1, AC-2, QH, AC-29) presented significant challenges. Cytoplasmic and mitotic patterns were less consistently recognized than nuclear and nucleolar patterns. These results highlight the need for continued education to enhance pattern recognition, aligning with BCA and ICAP recommendations.

Figure 1: The six competent-level standards processed and examined presented an overall accuracy rate of 83.1%. For most of the evaluated standards, more than 85% of laboratories reached the competent level. However, for the core standards with a positive metaphase plate (AC-1 and AC-2), the accuracy rates were below 70%.

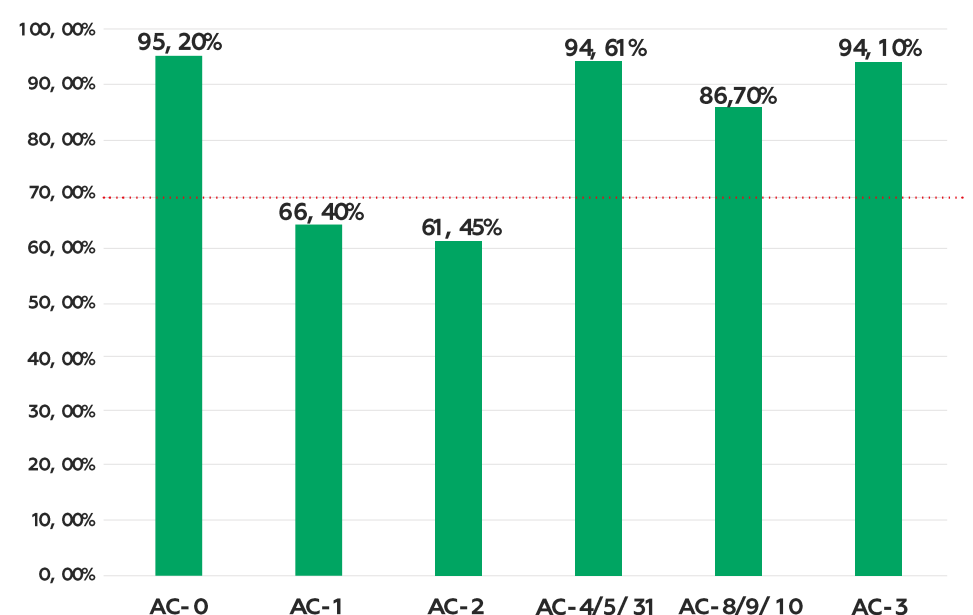
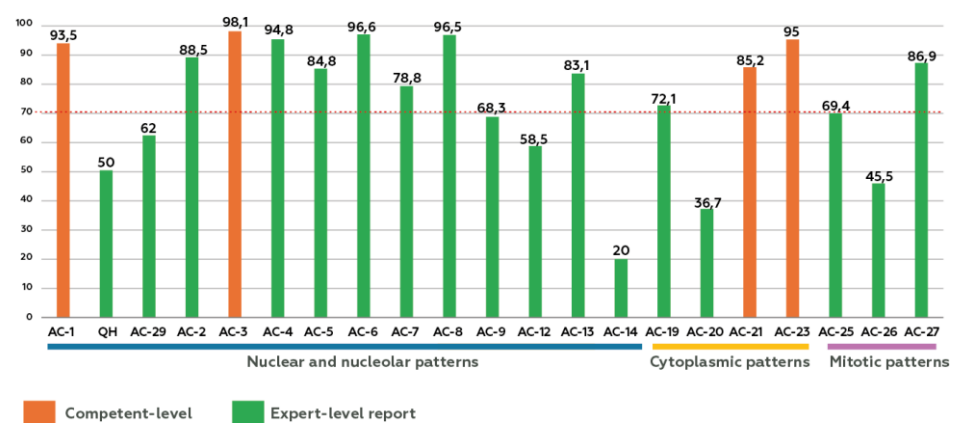


Figure 2: The overall accuracy rate is 69.73%, indicating a moderate performance of laboratories in identifying the analyzed patterns. Some patterns with an accuracy rate below 50% (QH, AC-14, AC-20, AC-26) represent a limitation and highlight the need for training. The average accuracy rate by pattern group was 77.1% for nuclear patterns, 82.4% for nucleolar patterns, 72.2% for cytoplasmic patterns, and 67.3% for mitotic patterns.



DISCLOSURE

The authors confirm that they don't have any conflict of interest to declare.

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