RESEARCH ARTICLE

Performance evaluation of Elecsys SARS-CoV-2 Antigen immunoassay for diagnostic of COVID-19

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Abstract

One of the challenges for control and prevention of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection is the early diagnostic at the point of care. Several tests based on qualitative antigen detection have been developed; one of these is Elecsys SARS-CoV-2 Antigen immunoassay (Roche Diagnostics). In total, 523 nasopharyngeal swabs were randomly selected with the aims to evaluate sensitivity, specificity, cross-reactivity, positive and negative predictive value (PPV, NPV), and agreement of Elecsys SARS-CoV-2 Antigen immunoassay using reverse transcription-polymerase chain reaction (RT-PCR) STAT-NAT® coronavirus disease-2019 as reference test. Cross-reactivity was estimated using samples positive by RT-PCR to other respiratory viruses (influenza virus, parainfluenza virus, rhinovirus, coronavirus OC43, and HKU1). The overall sensitivity of Elecsys SARS-CoV-2 Antigen was 89.72% (288/321); specificity was 90.59% (183/202); and cross-reactivity to other respiratory viruses were not detected. Elecsys SARS-CoV-2 Antigen immunoassay showed a high sensitivity in samples with cycle threshold value <30, which ranged from 92.81% to 95.40%, independently of symptoms. PPV and NPV were 93.81% and 84.72%, respectively. The κ coefficient was 0.79 (95% confidence interval: 0.73–0.84), showing substantial agreement between both tests. The results suggest Elecsys SARS-CoV-2 Antigen immunoassay could be used as an alternative to RT-PCR testing, or in complement with it, to identify infectious individuals and reduce SARS-CoV-2 transmission.

KEYWORDS
cross reactivity, immunoassay, SARS-CoV-2 antigen tests, sensitivity, specificity

1 | INTRODUCTION

According to the World Health Organization (WHO), more than 152 million confirmed cases of coronavirus disease-2019 (COVID-19) were reported worldwide starting May 2021, causing 3 198 528 deaths.[1] The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the etiological agent of COVID-19 disease that has put the healthcare systems in many countries under tremendous pressure persistently.

COVID-19 was declared a pandemic in March 2020. Owing to its high transmissibility rate, the rapid identification of positive cases is critical to reduce its spread. The gold standard method, in terms of

sensitivity and specificity, for SARS-CoV-2 diagnosis is the real-time reverse transcription-polymerase chain reaction (RT-PCR). However, to get accurate results with RT-PCR, it is necessary to establish a good workflow, with trained personal, equipment specifics, and laboratories (preanalytical, analytical). Furthermore, the results could take time, although not more than 24 h.

To reduce infection and make opportune decisions at the point of care (POC), a rapid and reliable diagnostic test for detection of SARS-CoV-2 infection is needed. For this purpose, several rapid tests for qualitative antigen detection (PanbioTM COVID-19 Ag Rapid Test, COVID-19 Ag Respi-Strip) have been developed. The principle of the lateral-flow immunochromatographic is the basis of the majority of rapid tests; obtaining results in minutes without any instrumentation. LUMIPULSE is another assay, which uses a LUMIPULSE G600II automated immunoassay analyzer, to detect SARS-CoV-2 antigen quantitatively; furthermore, results are ready in 30 min.[2] SOFIA SARS Antigen FIA, STANDARD F COVID-19 Ag FIA, and FIC assay are other antigen tests that also need an analyzer.[3,4]

Nucleocapsid is the most used SARS-CoV-2 protein for antigen detection, since it is the most expressed virus derived-protein, and its nucleotide sequence is conserved in time.[5] Nonetheless, there are other lateral flow assays (LFA) designed to identify viral spike proteins using glycans, nanoparticles, and antibodies.[6] Peto[7] developed an LFA to detect all SARS-CoV-2 structural proteins, which showed good sensitivity and specificity. Clinical samples collected from the upper respiratory tracts, like nasopharyngeal swabs (NPS) and saliva, have been used for antigen detection; being sensitivity the main problem of these assays.[8,9]

Elecsys SARS-CoV-2 Antigen test is an immunoassay that runs on the cobas® e systems, produced by Roche Diagnostic for the qualitative detection of SARS-CoV-2 antigen in NPS. The manufacturer reports Elecsys SARS-CoV-2 Antigen tests to have a throughput of 300 tests per hour, depending on the analyzer used.

In 2020, Cuba achieved good control of the COVID-19 pandemic; but since January 2021 with the third wave, the number of confirmed cases increased. to improve SARS-CoV-2 diagnosis, the Cuban Health System inaugurated 27 laboratories for molecular diagnosis around the country. Currently, the National Reference Laboratory for Respiratory Virus (NRLRV) at the Institute of Tropical Medicine Pedro Kourí, receives a high volume of clinical samples for diagnostic and reference. Thus, it is necessary to find a faster and more affordable test for SARS-CoV-2 detection and complement its diagnosis. The main contribution of this investigation is the evaluation of the clinical performance of Elecsys SARS-CoV-2 Antigen assay using NPS that was sent to NRLRV.

2 | MATERIALS AND METHODS

2.1 | Study design and samples

Clinical performance was conducted using NPS specimens sent for the diagnosis of SARS-CoV-2 infection in March 2021, with a collection time of less than 48 h. The study was performed in accordance with the ethical principles of the Declaration of Helsinki. Clinical samples used were anonymously leftover NPS. The average age of the tested persons was 36.71 years old; with minimum and maximum age ranging from 5 months to 96 years old, respectively.

Samples were selected randomly based on the number of samples necessary to perform the assay. In total, 523 NPS were collected, grouped according to the epidemiological definitions of NPS samples used in the NRLRV (Table 1): reference of confirmed cases (n = 135, NPS from individuals with a positive RT-PCR for SARS-CoV-2, the same sample is used for retesting); contact cases (n = 132, samples from individuals who had any contact with a confirmed or suspected COVID-19 case in the last 14 days before specimen collection); SARS-CoV-2 tracing at 5 days of diagnosis (n = 78, samples collected 5 days after positive RT-PCR for SARS-CoV-2); suspect cases (n = 59, NPS collected from subjects who met clinical criteria of COVID-19 and were contacts of a probable case); and surveillance (n = 119, NPS collected to international travelers on arrival).

Several viral transport mediums (VTM) available in the national net of healthcare were used (BTV BIOCEN [n = 360 NPS]; CITOSWAB VTM [n = 63 NPS]; and Sansure Store Reagent [n = 100 NPS]). The following swabs were used: NFS-Swab applicator (Noble Bio; Clinical Diagnostic Product); CNEURO polyester tipped applicators (BioCubaFarma); Copan Flocked Swab (Huachenyang

Epidemiological definition of NPS samples (n)	RT-PCR for SARS-CoV-2	
	Positives	Negatives
Reference of confirmed cases (135)	121	14
Contact cases (132)	63	69
SARS-CoV-2 tracing at 5 days of diagnosis (78)	52	26
Suspected cases (59)	34	25
Surveillance (119)	51	68
Total (523)	321	202

TABLE 1 Stratification of NPS according to the epidemiological definition of samples and positivity to SARS-CoV-2 RT-PCR

Abbreviations: NPS, nasopharyngeal swabs; RT-PCR, reverse transcription-polymerase chain reaction; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

Technology, China); and Mantacc disposable sampling swab (Miraclean Technology).

2.2 | Elecsys SARS-CoV-2 Antigen immunoassay

This assay is an in vitro electrochemiluminescence immunoassay (ECLIA) to be used in cobas® e (411, 601, 602) analyzers (Roche Diagnostics, International Ltd). This assay was designed for the qualitative detection of nucleocapsid SARS-CoV-2 antigen in NPS. Elecsys SARS-CoV-2 Antigen uses a double-monoclonal antibody sandwich with biotin-streptavidin. Elecsys SARS-CoV-2 Antigen assay was performed following manufacturer's instructions, in cobas® e411 module. Results were interpreted as follows: cutoff index (COI) < 1.0 for samples nonreactive/negative to SARS-CoV-2 antigen and COI ≥ 1.0 for samples reactive/positive to SARS-CoV-2 antigen. Sensitivity and specificity evaluated with RT-PCR Cobas SARS-CoV-2 by Roche manufacturers were 94.5% (symptomatic patients) and 99.9% (asymptomatic and symptomatic subjects), respectively.[10]

2.3 | Gold test: SARS-CoV-2 RT-PCR

Qualitative detection of SARS-CoV-2 RNA from NPS was assessed using STAT-NAT® COVID-19 MULTI (SENTINEL Diagnostic) multiplex assay; based on the simultaneous detection of RdRP and ORF1b genes. Its limit of detection is 10 copies/reaction and the assay was performed in Rotor-Gene Q 3000 (QIAGEN). Samples with a threshold cycle (C_t) of fewer than 40 were considered positives.

The relationship between the amount of viral RNA, measured as C_t value of the RT-PCR, and SARS-CoV-2 antigen detection was estimated. Therefore, C_t values were stratified as high ($C_t \leq 26$), moderate ($26 < C_t \leq 35$), and low ($35 < C_t \leq 40$) viral concentration.

2.4 | Clinical performance of Elecsys SARS-CoV-2 Antigen assay

2.4.1 | Sensitivity

Sensitivity was calculated as the proportion of samples reactive to Elecsys SARS-CoV-2 Antigen immunoassay relative to the total number of samples (n = 321), that were positive by SARS-CoV-2 RT-PCR testing.

2.4.2 | Specificity

This percentage was considered as the number of samples nonreactive with Elecsys SARS-CoV-2 Antigen immunoassay, relative to the total amount of samples that were negative (n = 202) by SARS-CoV-2 RT-PCR assay. In this group, cross-reactivity and viral interference were assessed using 17 NPS samples negative to

SARS-CoV-2 RT-PCR. These NPS were collected as part of the routine diagnosis for respiratory virus infections during 2019. First, the samples were tested with the Elecsys SARS-CoV-2 Antigen assay; the test included the following samples: influenza virus A (n = 9) and B (n = 1); parainfluenza virus type 3 (n = 3); coronavirus OC43 (n = 2) and HKU1 (n = 1); and rhinovirus (n = 1). All samples were conserved at −80°C and their viral RNA levels, expressed as C_t values, ranged from 20 to 24. The second step, to evaluate viral interference of other respiratory viruses (non-SARS-CoV-2) with Elecsys SARS-CoV-2 Antigen immunoassay, samples used to assess cross-reactivity was mixed volume:volume with 17 samples reactive to Elecsys SARS-CoV-2 Antigen with COI ≥ 10 and C_t values categorized as high viral concentration. Cross-reactivity and interference were measured as the percentage of samples tested that were reactive with the Elecsys SARS-CoV-2 Antigen immunoassay relative to the total cohort.

2.4.3 | Repeatability

Elecsys SARS-CoV-2 Antigen repeatability was evaluated between runs with the same analysts, laboratory, instruments, and day. Forty-two clinical samples were examined by duplicate and percentage of coefficient of variation (% CV). The value of % CV represents the standard deviation of the samples relative to the mean of the dataset; it is used as a precision evaluation of the Elecsys SARS-CoV-2 Antigen.

2.4.4 | Concordance between the Elecsys SARS-CoV-2 Antigen immunoassay and SARS-CoV-2 RT-PCR

Comparison between both methods was estimated using Cohen's κ coefficient and interpreted as follows: poor (<0.50), moderate (0.50–0.74), substantial (0.75–0.90), and almost perfect agreement if >0.90.[11]

2.4.5 | Positive and negative predictive values

The following terminology was defined: true-positive (TP) is the number of clinical samples reactive to Elecsys SARS-CoV-2 Antigen immunoassay with positive results under RT-PCR to SARS-CoV-2; false-positive (FP) is the number of clinical samples reactive under-evaluated test with negative results using the reference test; true-negative (TN) is the amount of clinical samples nonreactive to Elecsys SARS-CoV-2 Antigen immunoassay, with negative results under RT-PCR; and false-negative (FN) is the number of clinical samples nonreactive with the evaluated test, but yielding positive results using SARS-CoV-2 RT-PCR test.

The positive predictive value (PPV) index was estimated as the percentage of TP, relative to the TP and FP combined. Conversely, the negative predictive value (NPV) index is estimated as the proportion of TN, relative to total TN and FN.

2.5 | Statistical analysis

A cross-sectional study was conducted; using contingency table 2 × 2 and the confidence intervals (CIs) were estimated at 95% (95% CI). Descriptive statistics were also used such as means, medians, the difference between medians, and interquartile ranges between 25th and 75th percentiles. Spearman correlation test was assessed to calculate the correlation between C_t values of SARS-CoV-2 RT-PCR and COI of positive samples. A nonparametric test between unpaired data was performed, to establish the significance of results and $p \leq 0.05$ was considered as statistically significant. All statistical analysis was calculated using GraphPad Prism® software (version 9.1.0).

3 | RESULTS

3.1 | Clinical performance: Sensitivity, specificity, PPV, and NPV

The sensitivity of Elecsys SARS-CoV-2 Antigen was 89.72% (288/321) (95% CI: 85.87–92.82) (Table 2). The COI median of reactive samples to Elecsys SARS-CoV-2 Antigen was 125.2 (interquartile range [IQR]: 13.06–1634). According to the epidemiological definition of the NPS samples, high sensitivity was found in samples tested for reference of confirmed cases (99.17%; 95% CI: 95.47–99.96) and samples for SARS-CoV-2 tracing at 5 days of diagnosis (94.23%, 95% CI: 84.36–98.43). Lower sensitivity was detected in NPS from surveillance (78.43; 95% CI: 65.37–87.51).

Overall specificity was 90.59% (183/202) (95% CI: 85.70–94.24) (Table 2). The median COI values for nonreactive samples was 0.71 (IQR: 0.64–0.79). High specificity was found in samples from contact cases (97.06; 95% CI: 89.90–99.48) and SARS-CoV-2 tracing at 5 days of diagnosis (96.15%; 95% CI: 81.11–99.80). Lower specificity was identified in samples tested for reference of confirmed cases (71.43%; 95% CI: 45.35–88.28).

Regarding cross-reactivity, no NPS were reactive with Elecsys SARS-CoV-2 Antigen, thus specificity in these samples was 100%. Concerning viral interference, all samples preserved their COI positivity values, after these were mixed with medium positive to other respiratory viruses. Medians of COI values were 37.44 (IQR: 22.43–78.35) and 22.01 (IQR: 17.23–45.14), in NPS samples before and after mixed, respectively. Difference between medians were not statistically significant ($p = 0.1457$).

Elecsys SARS-CoV-2 Antigen assay showed a PPV and NPV of 93.81% (95% CI: 90.50–96.23) and 84.72% (95% CI: 79.22–89.24), respectively. PPV and NPV were estimated by epidemiological sample type (Table 2). PPV was higher in samples collected for reference of confirmatory cases (96.77%) and virus tracing at 5 days of diagnosis (98.00%).

3.2 | Sensitivity of Elecsys SARS-CoV-2 Antigen assay relative to C_t and comparing C_t with COI

Overall, no correlation was observed between C_t values of positive samples to SARS-CoV-2 RT-PCR and COI ($r = -0.38$, $p < 0.0001$). The distribution of COI and C_t values was characterized according to the epidemiological definition of NPS samples (Figure 1). Consequently, samples with C_t values over 30 exhibited COI higher than samples with C_t values near 20. Percentages of the sensitivity of Elecsys SARS-CoV-2 Antigen assay relative to C_t values of SARS-CoV-2 RT-PCR were calculated and ranged from 92.81% (95% CI: 87.59–95.94) to 95.40% (95% CI: 88.77–98.20) in NPS with $C_t \leq 26$ (142/153) and $26 < C_t \leq 30$ (83/87), respectively. Furthermore, this proportion decreased to 77.77% (95% CI: 67.58–85.46) in NPS with $30 < C_t \leq 40$ (63/81).

3.3 | Assessment of repeatability and concordance between the Elecsys SARS-CoV-2 Antigen assay and RT-PCR SARS-CoV-2

The overall mean of the CV of 42 evaluated samples was 4.47% (95% CI: 3.54–5.40). For reactive samples, CV was 5.11% (95% CI:

TABLE 2 Distribution of sensitivity, specificity, PPV, and NPV according to the epidemiological definition of NPS samples

Epidemiological definition of NPS samples	+RT PCR/n	% (95% CI) Sensitivity	Specificity	PPV	NPV
Reference of confirmed cases	121/135	99,17 (95.47–99.96)	71.43 (45.35–88.28)	96.77 (92.00–98.74)	90.91 (62.26–99.53)
Contact cases	63/132	82,81 (71.79–90.12)	97.06 (89.90–99.48)	94.55 (85.15–98.51)	85.71 (76.20–91.83)
SARS-CoV-2 tracing at five days of diagnosis	52/78	94.23 (84.36–98.43)	96.15 (81.11–99.80)	98.00 (89.50–99.90)	89.29 (72.80–96.29)
Suspected cases	34/59	79.41 (63.20–89.65)	92.00 (75.03–98.58)	93.10 (78.04–98.77)	76.67 (59.07–88.21)
Surveillance	51/119	78.43 (65.37–87.51)	86.76 (76.72–92.88)	81.63 (68.64–90.02)	84.29 (74.01–90.99)
Total	321/523	89.72 (85.87–92.82)	90.59% (85.70–94.24)	93.81 (90.50–96.23)	84.72% (79.22–89.24)

Abbreviations: CI, confidence interval; NPV, negative predictive value; PPV, positive predictive value; RT-PCR, reverse transcription-polymerase chain reaction; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.
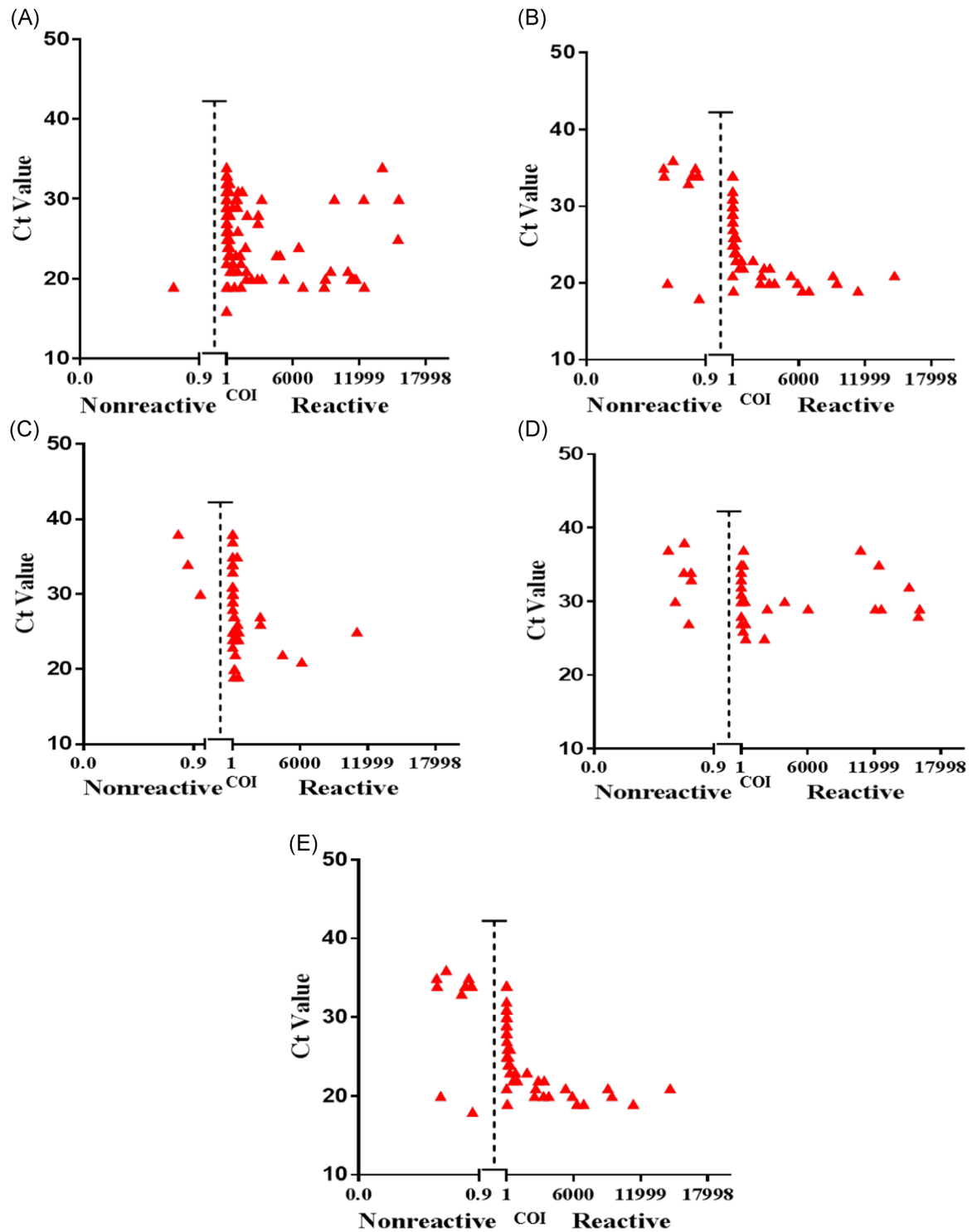
FIGURE 1 Distribution of COI values according to C_t values in positive samples to SARS-CoV-2 RT-PCR, taking into account the epidemiological definition. (A) Reference of confirmed cases; (B) contact cases; (C) SARS-CoV-2 tracing at 5 days of diagnosis; (D) suspect cases; and (E) surveillance. COI, cutoff index; RT-PCR, reverse transcription-polymerase chain reaction; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2

4.07–6.16) and for nonreactive samples, it was 3.61% (95% CI: 1.63–5.59). The κ coefficient was 0.79 (95% CI: 0.73–0.84) and the percentage of agreement was 90.06% (95% CI: 87.09–92.42).

Finally, concerning the VTM used, discordant results were obtained by frequency order with CITOSWAB VTM (34.92%, 22/63); BTV BIOCEN (7.22%, 26/360), and Sansure Store Reagent (4.00%, 4/100).

4 | DISCUSSION

Early diagnostic and the application of a reasonable test algorithm to detect SARS-CoV-2 infection are critical to reduce its transmission. Elecsys SARS-CoV-2 Antigen assay decreases the time of results to minutes, with a high throughput of samples per hour.

The sensitivity of Elecsys SARS-CoV-2 Antigen assay was lower (89.72% vs. 94.5%) in comparison with that reported by the manufacturer, who used NPS from symptomatic individuals with $C_t < 30$. However, overall sensitivity independently of the presence of symptoms is in agreement with the minimum performance requirements set by WHO for antigen tests at ≥80%.[12] In agreement with other studies, the sensitivity of Elecsys SARS-CoV-2 Antigen assay decreased with the increase of C_t values; probably due to declining of virus concentration under the detection limit of the assay. For this reason, some authors recommend these assays in the early phases of acute infection.[13] Good performance was reported by Porte et al.[3] in samples with $C_t \leq 25$ using rapid SARS-CoV-2 antigen detection tests. It should also be noted that C_t values and COI were obtained with different viral targets. SARS-CoV-2 RT-PCR was based on the simultaneous detection of RdRP and ORF1b genes, indispensable for viral replication and usually detected at low viral load ($\geq 10^1$ copy/μl).[14] Conversely, Elecsys SARS-CoV-2 Antigen assay detects nucleocapsid protein expressed in the infectious viral progenies, which usually do not exceed the amount of viral RNA production, reducing the sensitivity of the antigen assays.[15]

Correlation between C_t values and antigen concentrations was not detected. Amendola et al.,[8] using Lumipulse® G SARS-CoV-2 Ag assay, obtained analogous results with clinical specimens. As it is widely known, PCR amplifies a significant amount of copies from a single complementary DNA chain, while antigen tests detect the molecules present in NPS specimens at the moment of collecting.

Nucleocapsid protein is an abundant RNA-binding protein critical for viral genome packaging. Furthermore, it contributes to hosting cell entry of SARS-CoV-2 and recruitment of components for viral replication.[16] A decrease in antigen (nucleocapsid protein) detection is expected in correspondence with the decrease of viral amount (increasing of C_t value). However, in some NPS, high COI values were detected with C_t values both over 30 and near 20. It is likely that the time of infection at which NPS were collected justifies this finding. Since the antiviral immune response induced after onset infection may reduce viral assembly generating defective viral particles. This reduction in viral assembly indicates that uncoating RNA could be degraded by cell proteases; consequently, viral genome amount

would decrease gradually increasing the C_t value. On the other hand, the temperature of transportation of NPS is critical because might cause RNA degradation; however, protein degradation is unlikely.

Percentages of sensitivity higher than ones obtained by the manufacturer were found in NPS tested for reference of confirmatory cases (99.17%) and SARS-CoV-2 tracing at 5 days of diagnosis (94.23%). According to the epidemiological definition of the samples, clinical sensitivity was almost similar to those reported by manufacturers in NPS collected from surveillance (78.43% vs. 75.0%); but a high percentage was found in contact cases (82.81% vs. 78.6%).[10]

Regarding specificity, contrary to that reported by the manufacturer overall specificity was lower (90.59% vs. 99.9%). The manufacturer used NPS from individuals with signs and symptoms suggestive of COVID-19, with known or suspected exposure to SARS-CoV-2, and from individuals in screening, negative to SARS-CoV-2 RT-PCR. The percentage of specificity was found to be comparable to the minimum requirement suggested for antigen tests by WHO (≥97%) in NPS collected from contacts (97.06%) and virus tracing at 5 days of diagnosis (96.15%). Kirk et al.[17] recommended if there is high clinical suspicion, the infection should not be discarded on the basis of RT-PCR alone, since FN proportion is low between 3 and 8 days after exposure. It should be noted that the detection of proteins is more stable since it is not affected by sampling storage, which could affect RNA stability and consequently the sensitivity of RT-PCR.[8] On the other hand, the type of VTM and use of medications could cause the Elecsys SARS-CoV-2 Antigen assay to detect analytes other than the one it was designed for.

Elecsys SARS-CoV-2 Antigen assay did not show cross-reactivity with a respiratory virus that produces symptoms and signs similar to COVID-19 at an acute phase. Comparable results were detected by the manufacturer in cross-reactivity and viral interference. Moreover, after dilution of NPS with positive samples to other respiratory viruses, none increased its COI values above the COI calculated without previous dilution. Therefore, as added value, the prozone effect, which could potentially be present in samples with low C_t values and high antigen concentrations, was not observed.

The percentage of Elecsys SARS-CoV-2 Antigen assay and RT-PCR STAT-NAT® COVID-19 MULTI agreement was 90.06%. FN and FP rates were 10.28% and 9.41%, respectively. Elecsys SARS-CoV-2 Antigen assay showed a good agreement with the RT-PCR used, suggesting that reactive and nonreactive results from NPS samples using this antigen test have a substantial precision in comparison with RT-PCR. Discrepancies in sensitivity and specificity with those found by the manufacturer might be also attributed to different RT-PCR tests used as reference techniques. Regarding CV between runs in reactive and nonreactive samples, the percentages obtained were included in the range described by the manufacturer for cobas e 411 analyzer (2.2%–5.8%).[8]

PPV is a measure of the performance of an assay and depends on infection prevalence. Overall, PPV (93.81%) was higher than NPV (84.72%). As a result, the likelihood that a "reactive" result is correct is highest in samples tested for reference of confirmatory cases, virus tracing at 5 days of diagnosis, and contact cases.

According to WHO guidelines, validation of antigen tests should be carried out using stratification by viral load expressed by C_t values and days postonset of symptoms, being the last criteria one limitation of this study.

Clinical performance of antigen tests depends on the rate of viral replication, the kinetics of viral protein expression, the VTM used, and the quality of the specimen. Since the VTMs that were available in POC were not described by the manufacturer in their evaluation, it was important to confirm that Elecsys SARS-CoV-2 Antigen assay is suitable for these NPS samples.

Barlev-Gross et al.[6] described the higher specificity of LFA based on spike protein in comparison with nucleocapsid LFA. Nevertheless, in the current context with the new SARS-CoV-2 mutations in the spike protein; FN results could arise due to these concerning variants not being recognized.

In conclusion, RT-PCR is the standard technique for SARS-CoV-2 detection, the capacity to support it is limited in low- and middle-income countries. NRLRV receives a high volume of samples, which could lead to a deficit in reagents and disposable materials. The proposition is to incorporate Elecsys SARS-CoV-2 Antigen assay in the diagnosis algorithm of SARS-CoV-2 as a screening method owing to its sensitivity. However, FP results must be evaluated with RT-PCR. This means that samples tested for reference of confirmatory cases, virus tracing at 5 days from diagnosis, contact cases, and suspect cases with reactive results by Elecsys SARS-CoV-2 Antigen assay should be considered as positive; and only FPs need confirmation by RT-PCR to rule out infection.

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CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

AUTHOR CONTRIBUTIONS

Conceptualized and performed the research; worked in the methodology and analyzed the data; wrote the manuscript; and checked and edited the manuscript: María C. Montalvo Villalba. *Performed the research; worked in the methodology and analyzed the data; and reviewed the manuscript*: Elena Sosa Glaria. *Conceptualized the research; reviewed the manuscript; and checked the manuscript*: Licel de los A. Rodriguez Lay. *Conceptualized; supervised and reviewed the research*: Odalys Valdés Ramirez. *Worked in the methodology; and performed the research and analyzed the data*: Dayana Vallina García. *Worked in the methodology*: Amely Arencibia Garcia. *Worked in the methodology*: Javier Martinez Alfonso. *Supervised the research*: Dunia Menes Llerena. *Supervised and reviewed the research*: Loida Torres Pérez. *Reviewed the manuscript*: Sonia Resik Aguirre. *Checked; edited, and reviewed the manuscript*: Maria G. Guzman Tirado.

DATA AVAILABILITY STATEMENT

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