

COVID-19 screening of asymptomatic health-care workers with a rapid serological test: experience of Cancer Institute “Giovanni Paolo II” Biobank

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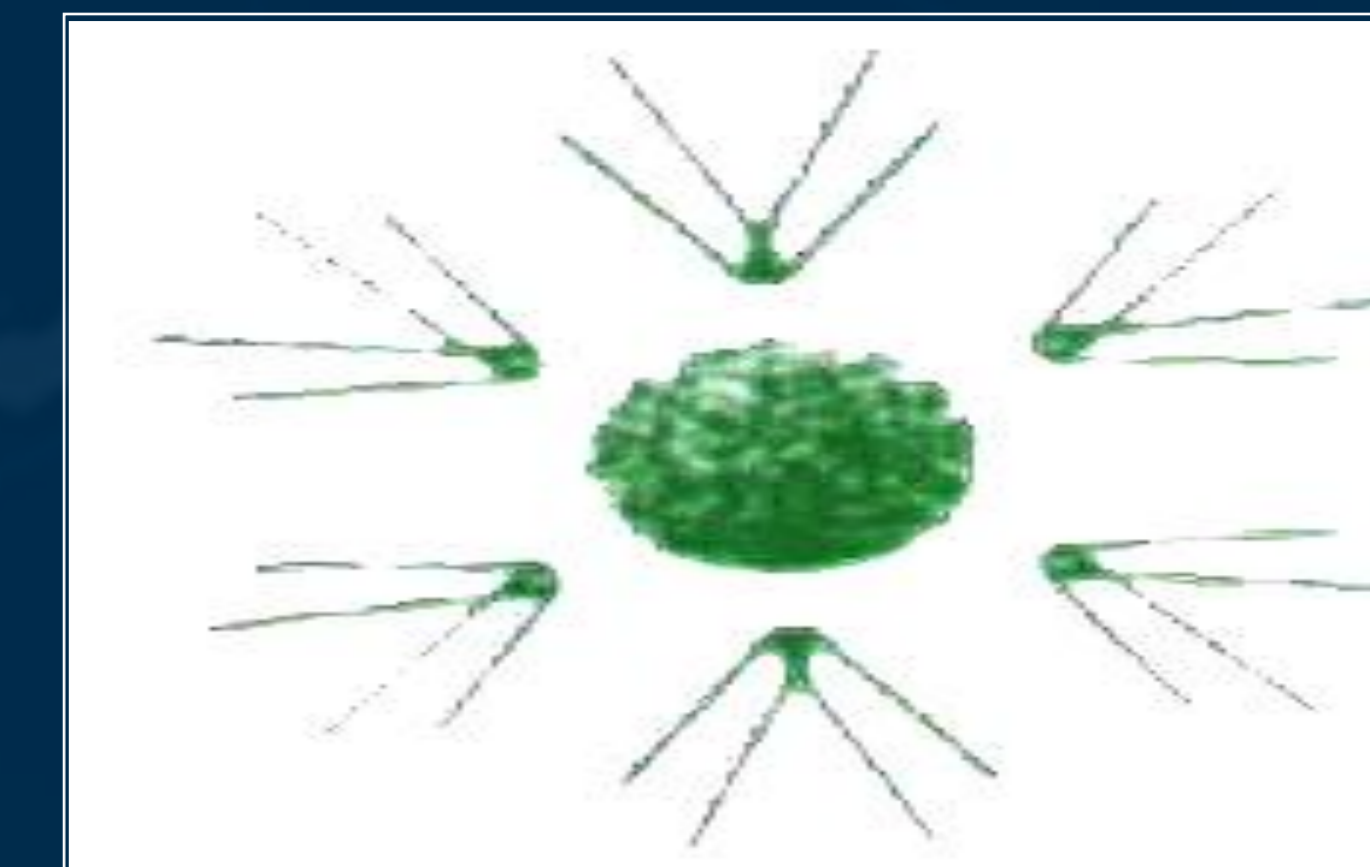
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INTRODUCTION

Health-care workers (HCW) are at high risk for SARS-CoV-2 infection and, if asymptomatic, for transmitting the virus on to fragile cancer patients.

AIM

We planned to screen a cohort of HCW to verify mainly applicability of a rapid serological test to an asymptomatic HCW population; but also:

- 1) prevalence of SARS-CoV-2 immunoreaction;
- 2) kinetics of IgM/IgG in HCW at 2 weeks interval;
- 3) comparison of rapid serological test results with respect to RT-PCR and CLIA assay

METHOD

We monitored all asymptomatic HCW of a cancer institute (93% of HCW accepted to enter the study).

Blood samples, treated as potentially infectious, were sent to the Institutional Biobank of the IRCCS Istituto Tumori “Giovanni Paolo II” of Bari to be processed and aliquoted in its BSL-2 lab, stored together with associated clinical data.

Rapid serological test Viva-Diag analyzing SARS-CoV-2 associated-IgM/IgG was used to characterise the biobank collected from 606 (time 0) and 393 (after 14 days) HCW.

RESULTS

Overall, 9 HCW (1.5%) resulted not-negative at Viva-Diag and one of them was confirmed positive for SARS-COV-2 infection at RT-PCR oropharyngeal swab.

At time 0, all 9 cases showed some IgM expression and only one IgG; after 14 days IgM persisted in all cases while IgG became evident in 4 ones.

CLIA confirmed a positive level of IgM in 5/13 positive Viva-Diag cases; conversely, IgG was confirmed positive at CLIA in 4/5 cases positive at Viva-Diag.

	FIRST ROUND	SECOND ROUND
COHORT CHARACTERISTICS	N=606 (%)	N=393 (%)
Sex		
Male	239 (39.4%)	142 (36.1%)
Female	367 (60.5%)	251 (63.9%)
Age	47.49 years (range: 20-73)	48.3 years (range: 20-66)
Role		
Clinical activity	328 (54.1%)	212 (53.9%)
Laboratory	54 (9%)	36 (9.1%)
Administrative	49 (8%)	79 (20.1%)
Maintenance/cleaning	175 (28.9%)	66 (16.8%)
Subjects with SARS-CoV-2 contacts	71 (11.7%)	42 (10.7%)
Subjects with minor symptoms	7 (1.1%)	5 (1.2%)
Quarantined subjects	41 (6.7%)	23 (5.8%)

Characteristics of the cohort of HCW screened for SARS-CoV-2

ID	2019-nCoV contacts	Minor symptoms	FIRST ROUND				SECOND ROUND					
			ViVaDiag Test Result		SARS-CoV-2 RT-PCR	CLIA ANALYSIS		ViVaDiag Test Result		SARS-CoV-2 RT-PCR	CLIA ANALYSIS	
			IgM	IgG		IgM (AU/mL)	IgG (AU/mL)	IgM	IgG		IgM (AU/mL)	IgG (AU/mL)
#1	No	No	Weak	Neg	Neg	1.715*	0.172	Neg	Weak	Neg	0.294	0.152
#2	No	No	Neg	Neg	Neg	0.277	0.157	Weak	Weak	Neg	0.31	0.295
#3	Yes	No	Pos	Neg	Neg	1.130*	0.132	Pos	Neg	Neg	0.546	0.294
#4	Yes	No	Neg	Neg	Neg	0.436	0.24	Weak	Weak	Pos	0.391	5.397*
#5	Yes	No	Weak	Neg	Neg	0.492	0.39	Weak	Neg	Neg	0.274	0.108
#6	No	No	Weak	Neg	Neg	0.569	0.15	Neg	Neg	Neg	0.3	0.119
#7	No	No	Weak	Neg	Neg	0.826	0.283	Pos	Neg	Neg	0.296	0.08
#8	Yes	No	Pos	Pos	Neg	1.184*	6.918*	Pos	Pos	Neg	0.772	9.96*
#9	No	No	Weak	Neg	Neg	0.365	2.611*	Neg	Neg	Neg	-	-

Results of ViVaDiag, RT-PCR and CLIA related to HCW with positive ViVaDiag results at the first round of monitoring

CONCLUSIONS

- 1) 1.5% of our HCW with serological test not negative but all resulted negative for SARS-CoV-2 test; the prevalence of Ig positive subjects increases to 1.8% in the second round of serological tests but, interestingly, one of them, had a successive RT-PCR test positive for SARS-CoV-2 infection;
- 2) an increase in IgG positivity in second samples;
- 3) it seems CLIA could be less sensitive test in analyzing IgM/IgG presence

Our study based on largely representative blood biobank, then included in the COVID BBMRI-ERIC Directory, suggest that Viva-Diag assay can be of help in individualizing SARS-CoV-2 infected people first of all in cohorts of subjects with high prevalence.

Different performances of serological colorimetric and CLIA tools remain to be ascertained.

REFERENCES

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