

Characterizing the immune response in patients with renal cell carcinoma (RCC) following COVID-19 vaccination

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BACKGROUND

- There have been several studies exploring the biological impact of the COVID-19 vaccination in cancer patients, particularly those with solid tumors.
 - Seroconversion rates in these studies range from 86-98%.¹⁻⁶
 - Only a limited subset of the patients included in these studies have a diagnosis of RCC.
- Our study sought to determine the biological effect of commercially available COVID-19 vaccinations, in the United States, in patients with RCC.

METHODS

- Eligibility criteria included:
 - A diagnosis of prostate, bladder, or kidney cancer.
 - No prior COVID-19 vaccination.
 - Willingness to get vaccinated.
- Blood was collected prior to the patient receiving a COVID-19 vaccination, and at 2, 6, and 12 months following the first dose of the vaccine.
- Patients receiving systemic treatments provided additional blood at three consecutive therapy cycles.
- Serum specimens were assessed for antibody titers using the SCoV-2 Detect™ IgG ELISA Assay, and results were reported as immune status ratios (ISR).

CONCLUSIONS

- With a seroconversion rate of 92%, our data suggest a sufficient COVID-19 antibody response in a majority of patients with RCC who have received a commercially available COVID-19 vaccine.
- Specimen collection is ongoing to assess for any changes in ISR values at 6 and 12 months, as well as following administration of the booster dose.
- Further analysis will be conducted to identify vaccine-induced clonotypes through T-cell receptor sequencing.
- Limitations of our study include limited sample size and lack of synchrony in specimen collection timepoints across patients.
- Future efforts should focus on individuals who achieve suboptimal antibody titers.

RESULTS

Figure 1. Changes in ISR by treatment type

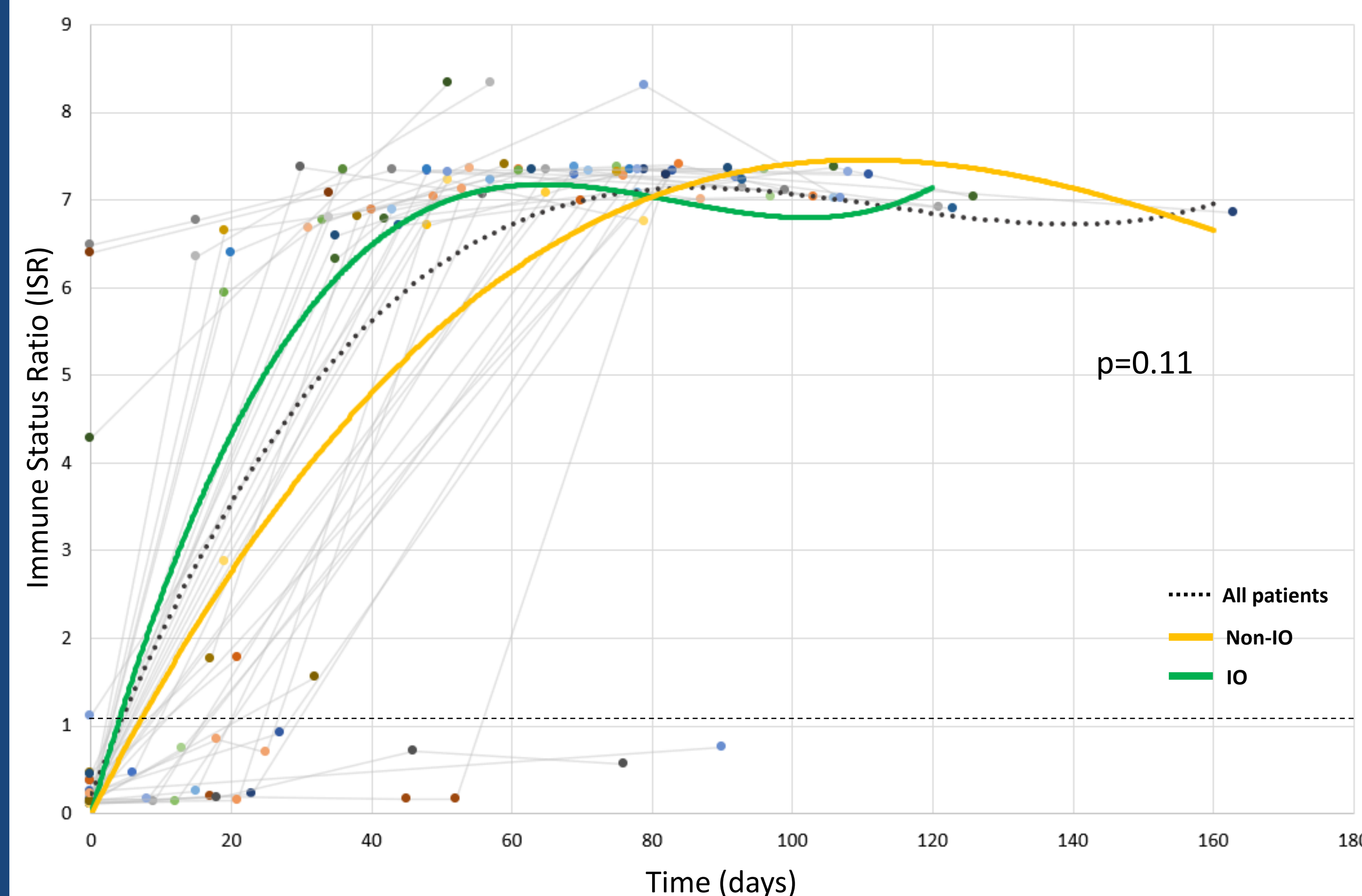


Figure 2. Changes in ISR by vaccine administered

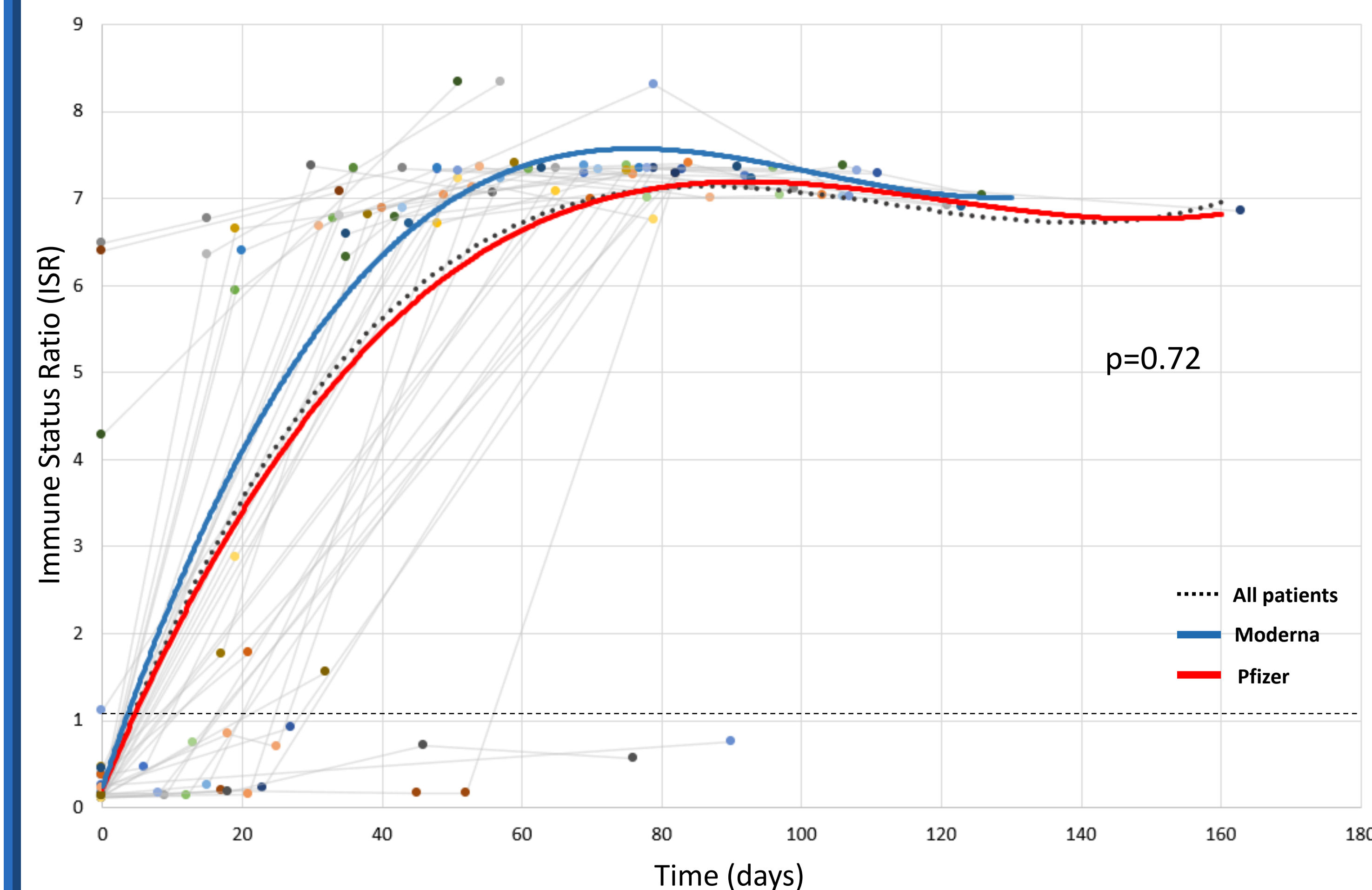


Table 1. Demographics of the RCC patient cohort

Patient Demographics	
Number of patients	38
Median age, years (IQR)	63 (57-70)
Gender – no. (%)	
Male	26 (68.4%)
Female	12 (31.6%)
Race – no. (%)	
White	31 (81.6%)
Asian	4 (10.5%)
Black	1 (2.6%)
Unknown	2 (5.3%)
Systemic treatment type – no. (%)	
Immunotherapy (IO)	22 (57.9%)
Targeted Therapy	13 (34.2%)
Chemotherapy	1 (2.6%)
Administered vaccine – no. (%)	
BNT162b2 (Pfizer)	25 (65.8%)
mRNA-1273 (Moderna)	13 (34.2%)
Comorbidities – no. (%)	
Cardiovascular	24 (63.1%)
Auto-immune	8 (21.1%)
Pulmonary	3 (7.9%)
Diabetes	3 (7.9%)

Table 2. Patients with negative antibody titers 2 months following COVID-19 vaccination

	Patient 1	Patient 2	Patient 3
Sex	Male	Male	Male
Age	64	73	59
Race	White	White	White
Vaccine	Pfizer	Moderna	Pfizer
ISR baseline	0.12	0.26	0.15
ISR month 2	0.16	0.76	0.71
Elapsed time (Days)	52	90	46
Metastatic disease	Yes	Yes	Yes
Treatment	Cabozantinib + nivolumab	Not on active treatment	Nivolumab
Immunosuppressive drug	None	Methotrexate Methylprednisolone	None
Recent surgery	Yes	No	No
Comorbidities	HTN	Rheumatoid arthritis, vasculitis	Chronic kidney disease

References:

¹A Thakkar et al. *Cancer Cell* (2021); <https://doi.org/10.1016/j.ccell.2021.06.002>
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³T Goshen-Lago et al. *JAMA Oncology* (2021); <https://doi.org/10.1001/jamaoncol.2021.2675>
⁴D Iacono et al. *J Geriatric Oncology* (2021); <https://doi.org/10.1016/j.jgo.2021.06.002>
⁵L Monin et al. *Lancet Oncology* (2021); [https://doi.org/10.1016/S1470-2045\(21\)00213-8](https://doi.org/10.1016/S1470-2045(21)00213-8)
⁶A Massarweh et al. *JAMA Oncology* (2021); <https://doi.org/10.1001/jamaoncol.2021.2155>

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