

Effect of Immunotherapy in Gastrointestinal Cancers Based on Time of Treatment

Manavi Bhagwat, MD¹, Daniel Leary, MS², Darbaz Adnan, MBChB³, Audrey Kam, MD¹, and Faraz Bishehsari, MD, PhD⁴



1) Rush University Medical Center, Chicago, IL

2) Rush Medical College, Chicago, IL

3) Center for Integrated Microbiome and Chronobiology Research, Rush University Medical Center, Chicago, IL

4) Rush Center for Integrated Microbiome & Chronobiology Research, Rush University Medical Center, Chicago, IL

Background and Aims

- Circadian rhythms are evolutionarily-conserved processes that operate as daily oscillations of biological machineries, such as those involved in cancer progression and immune response.
- Whether tumor immunity shows circadian variation is not known, however, emerging research suggests that the efficacy of cancer immunotherapy may vary by time of treatment.
- Chronoimmunotherapy has not been studied in gastrointestinal (GI) cancers.

Methods

- This was a retrospective study of patients with GI cancers who received immunotherapy (nivolumab, pembrolizumab, or atezolizumab) from 2017 to 2022 at a single, academic cancer center, Rush University Medical Center (Chicago, IL)
- Patients were excluded if they received less than 2 infusions or if their disease burden was not assessed at a 2-3 month follow up
- The primary outcome was tumor regression, defined as evidence of decreased tumor burden on radiographic imaging confirmed by the treating oncologist
- Patients were divided into two groups; those that received 50% or more infusions after noon and those that did not.
- We used chi-square analysis to compare disease regression between groups.

Results

- Between 2017 and March 2022, we identified 63 GI cancer patients at Rush University Medical Center who were treated with immunotherapy, of which 43 patients had enough data for analysis and were included in this study.
- There was a trend towards a higher incidence of tumor regression in the morning vs. afternoon group [(40% (9/21) vs. 18% (4/22), respectively, P=0.078].

	Infusion Group (n)		
	AM	PM	Total
Gender			
Female	10	6	16
Male	11	16	27
Race			
White	5	11	16
Black	7	3	10
Asian	3	2	5
Other	6	6	12
Ethnicity			
Hispanic	5	7	12
Not Hispanic	16	15	31
ECOG Grade			
0	5	4	9
1	7	8	15
2	8	9	17
3	1	1	2
ICI Therapy			
Pembrolizumab	13	12	25
Nivolumab	6	6	12
Atezolizumab	2	4	6

ECOG: Eastern Cooperative Oncology Group Performance Status. ICI: immune checkpoint inhibitor.

Table 1. Characteristics of included patients by infusion group.

Data

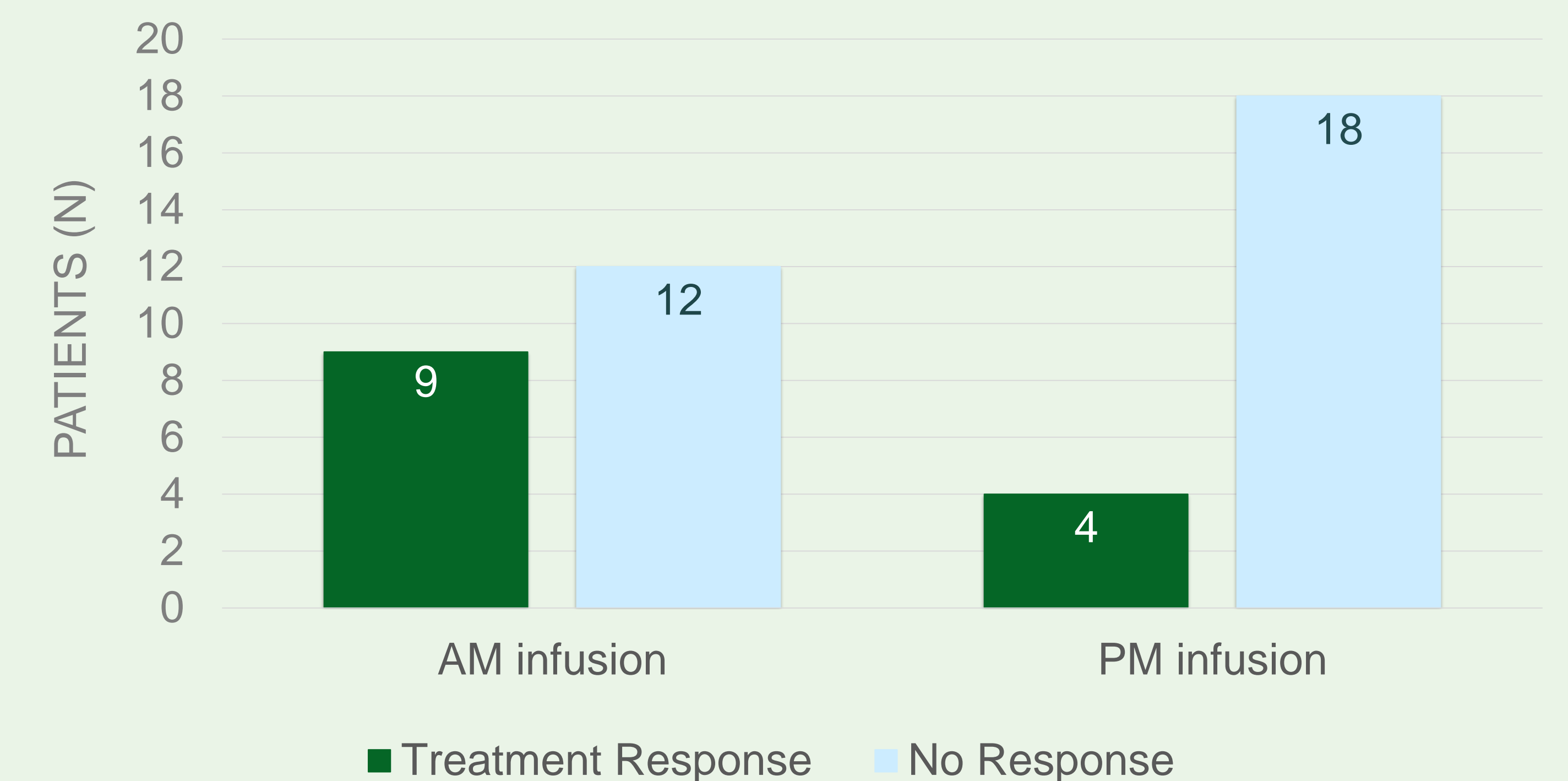


Figure 1. Initial treatment response by time of infusion

Discussion

- Immunotherapy is becoming more widely used in multiple GI cancer types.
- We found a trend towards a higher incidence of tumor regression based on the timing of immunotherapy in GI cancers in general.
- Although our sample size was limited, these findings are consistent with results from recent reports in other tumor types (i.e. melanoma, lung cancer), where administration of immunotherapy earlier in the day was associated with better outcomes.
- Larger studies will be needed to confirm these findings and to apply the concept of chronoimmunotherapy in GI cancers.