EFFICACY OF IMMUNONUTRITION IN GASTROINTESTINAL CANCER PATIENTS



A Systematic Review and Meta-Analysis

INTRODUCTION

The use of immunonutrition is becoming more prevalent in clinical practice, particularly in oncology care. The aim is to reduce surgical complications and enhance the quality of life for patients. We conducted a systematic review and meta-analysis to examine the impact of immunonutrition on postoperative outcomes in patients with gastrointestinal cancer.

METHODS

We systematically searched PubMed, Embase, and Cochrane Library (22.03.2024). We included studies with the following PICO framework: Population: gastrointestinal cancer patients, Intervention: immunonutrition, Control: no immunonutrition, Outcome: adverse events, length of hospital stay. The random-effects model yielded the pooled odds ratios (OR), mean difference (MD), and 95% confidence intervals (CIs).

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RESULTS

Effect of perioperative immunonutrition on infectious complications

	Immunonutrition		Control					
Study	Events	Total	Events	Total	Odds Ratio	OR	95% CI	Weight
upper GI					! 			
Farreras, 2004	2	30	9	30		0.17	[0.03; 0.85]	2.72%
Okamoto, 2009	2	30	8	30		0.20		2.69%
Kanekiyo, 2019	4	20	11	20			[0.05; 0.83]	3.35%
Marano, 2013	4	54	11	55			[0.10; 1.08]	4.01%
Kubota, 2014	4	26	10	29		0.35		3.65%
Mudge, 2018	22	65	23	62		0.87		6.41%
Fujitani, 2012	30	120	27	111	<u></u>	1.04		7.19%
Challine, 2021					<u></u>		[0.87; 1.46]	9.07%
Random effects model (HK		345		337			[0.28; 1.05]	39.09%
Heterogeneity: /2 = 64% [23%; 83	-			337		0.55	[0.20, 1.05]	33.0370
Test for effect in subgroup: $t_7 = \cdot$								
reserve enecesis seegroup. Ty	2.15 (p - 5.555)							
НВР								
Suzuki, 2010	1	10	6	10		0.07	[0.01; 0.84]	1.46%
Mikagi, 2011	0	13	1	13		0.31	[0.01; 8.30]	0.85%
Challine, 2021 c					-	1.12	[0.83; 1.50]	8.90%
Ciacio, 2021	42	199	36	200	-	1.22	[0.74; 2.00]	7.81%
Random effects model (HK	()	222		223		0.87	[0.20; 3.76]	19.03%
Heterogeneity: /2= 46% [0%; 82	%] , τ ² = 0.31, p = 0	.138						
Test for effect in subgroup: $t_3 = -$	-0.31 (p = 0.776)							
colorectal								
Ambrosio, 2022	0	50	2	50		0.10	[0.01; 4.10]	0.97%
-	3	47	16	126				
Tesauro, 2021	-					0.47		3.76%
Manzanares Campillo, 201	7 14	42	17	42			[0.30; 1.79]	5.50%
Challine, 2021 b		139	-	218			[0.85; 1.13]	9.46%
Random effects model (HK Heterogeneity: /2 = 0% [0%; 85%	-			210		0.71	[0.33; 1.54]	19.09%
Test for effect in subgroup: $t_2 = \cdot$		442						
rest for effect in soughoup. 13-	2.35 (p = 0.25) j							
gastrointestinal								
Giger, 2007	2	14	10	15		0.08	[0.01; 0.53]	2.28%
Braga, 2005	14	102	31	102	- - 	0.36	[0.18; 0.74]	6.55%
Bozzeti, 2007	66	500	78	393	-	0.61	[0.43; 0.88]	8.59%
Giger-Pabst, 2013	8	55	9	53		0.83	[0.29; 2.35]	4.76%
Random effects model (HK	()	671		563		0.45	[0.13; 1.54]	22.18%
Heterogeneity: /2= 52% [0%; 84	%] , τ² = 0.31, p = 0	.097						
Test for effect in subgroup: $t_3 = -$	-2.06 (p = 0.131)							
Pandom offorts model (UK	()	1277		12/1		0.63	[0.44.0.06]	100.00%
Random effects model (HK Heterogeneity: /2 = 60% [36%; 76	-	1377		1341		U.62	[0.44; 0.86]	100.00%
Residual heterogeneity: /2 = 53%					0.01 0.1 1 10	100		
		p = 0.006						
Test for overall effect: $t_{19} = -2.99$ Test for subgroup differences: χ^2		0.6287			Favor Favor			
restroi sungroup uniterences. X	- 1./4, u1 = 3 (p =	0.020 j			immunonutrition control			

Effect of perioperative immunonutrition on length of hospital stay

		Immunonutrition		The Control						
Study	N	Mean	SD	N	Mean	SD	Mean Difference	MD	95% CI	Weigh
preoperative										
Martin, 2017 *	44	10.56	8.42	27	18.54	23.36		-7.98	[-17.14; 1.17]	1.39
Senkal, 1999	78	22.20	4.10	76	25.80	3.80	+	-3.60	[-4.85;-2.35]	6.95
Aba, 2024	20	12.89	3.30	20	16.47	6.83	-	-3.58	[-6.90;-0.26]	4.75
Franceschilli, 2022	23	7.20	4.40	21	10.30	5.40	-	-3.10	[-6.03;-0.17]	5.18
Ku, 2006	30	9.00	2.20	30	12.00	3.70	+	-3.00	[-4.54;-1.46]	6.69
Braga, 2005	102	11.60	4.70	102	14.00	7.70	= :	-2.40	[-4.15;-0.65]	6.48
Horie, 2006	33	12.50	3.80	34	14.00	7.20	-	-1.50	[-4.25; 1.25]	5.38
Challine, 2021	606	14.60	12.80	1165	15.90	12.00	+	-1.30	[-2.53; -0.07]	6.97
Tesauro, 2021	47	4.85	2.25	125	6.06	3.95	+	-1.21	[-2.16;-0.26]	7.18
Fujitani, 2012 *	120	38.39	57.01	111	39.51	58.56		-1.12	[-16.04; 13.81]	0.59
Achilli, 2020*	74	9.12	6.04	101	10.06	6.77	-	-0.94	[-2.85; 0.97]	6.31
Manzanares Campillo, 2017	42	12.70	8.30	42	13.10	10.80		-0.40	[-4.52; 3.72]	3.97
Giger-Pabst, 2013	55	12.00	4.90	53	11.60	5.30	+	0.40	[-1.53; 2.33]	6.29
Ciacio, 2021	199	12.00	11.00	200	11.00	10.00	+	1.00	[-1.06; 3.06]	6.14
Gunerhan, 2009	13	16.54	14.83	11	14.22	9.12		2.32	[-7.38; 12.02]	1.26
Martin, 2018 *	38	30.75	29.93	38	17.07	8.44		13.68	[3.79; 23.57]	1.22
Random effects model	1524			2156			•	-1.56	[-2.68; -0.44]	76.76
Prediction interval							4		[-4.22; 1.10]	
ostoperative Varano, 2013	54	12.70	2.30	55	15.90	3.40		-3.20	[-4.29;-2.11]	7.08
-	E 4	12.70	2 20		15.00	2.40		2 20	[4 20, 2 44]	7.00
Gianotti, 1997	87	16.10	6.20	87	19.20	7.90	<u> </u>	-3.10		6.09
Aiko, 2008	15		15.49	14	29.00	11.22		-2.00		1.24
Random effects model	156			156					[-3.79;-2.44]	14.41
Heterogeneity:/= 0% [0%; 9	0%ኪ² =	1.34p =	0.970							
Test for effect in subgroup: t_2 =										
perioperative	1.4	12 70	2 20	15	22.10	2 60		0.40	[11 50. 7 22]	c 0.
Giger, 2007	14	13.70 27.28	2.30	15	23.10	3.60	= _		[-11.58; -7.22]	6.01
Kanekiyo, 2019 * Random effects model		27.20	4.76	20 35	30.52	11.90		-3.24	[-8.86; 2.38]	2.82
	34	_ 1 24	-0045	33				-0.09	[-40.13; 23.95]	8.83
Heterogeneity: I^2 = 75% [0%; 9 Fest for effect in subgroup: t_1 =										
Random effects model Prediction interval	1714			2347			<u> </u>	-2.20	[-3.59; -0.82] [-7.02; 2.62]	100.00
Heterogeneity:/²= 78% [67%;	OE0/12	- 4 04 5	- 0 001					\neg	[-7.02, 2.02]	
				. 0. 004			-40 -20 0 20	40		
Residual heterogeneity: $I^2 = 59$ Fest for overall effect: $t_{20} = -3.5$	-		- 1.54 p <	. U.UU1						
Test for subgroup differences:)	-	•	(p = 0.00	2)			Immunonutrition No immunon	utrition		
o /	~	,								
Means and/or standard dev										

CONCLUSIONS

The use of immunonutrition demonstrates promising results, reducing the likelihood of infectious complications and decreasing the length of hospital stays for patients undergoing treatment for gastrointestinal cancer and surgery.

