

Restrictive transfusion is non-inferior to liberal transfusion in upper gastrointestinal bleeding:

a systematic review and meta-analysis of randomised controlled trials

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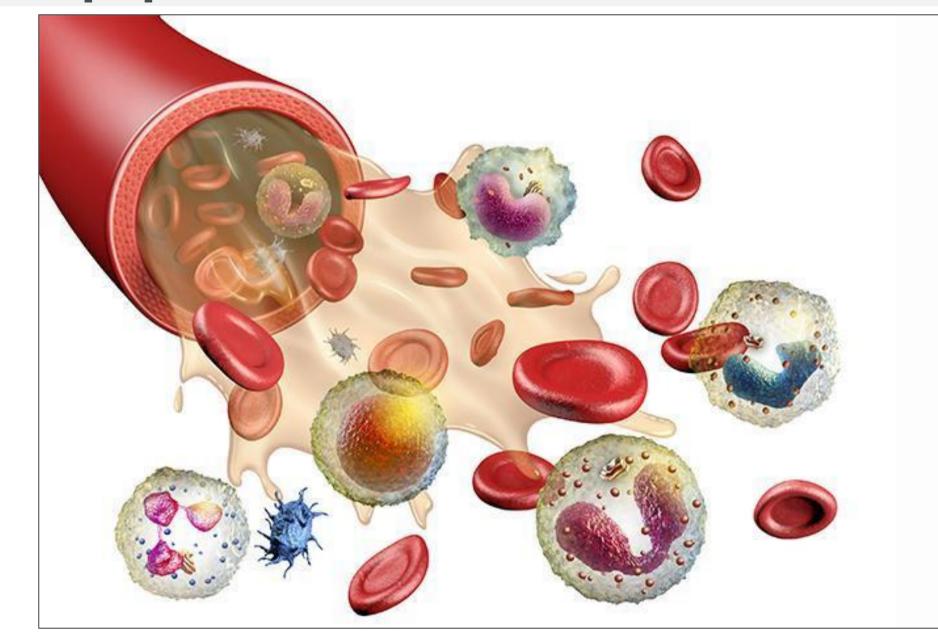
INTRODUCTION

The optimal red blood cell (RBC) transfusion strategy in acute gastrointestinal bleeding (GIB) is debated. We aimed to assess the efficacy and safety of restrictive compared to liberal transfusion strategies in the GIB population.



METHODS

We searched PubMed, CENTRAL, Embase, and Web of Science for randomised controlled trials on 15.01.2022 without restrictions. Studies comparing lower to higher RBC transfusion thresholds after GIB were eligible. We used the random effect model and calculated pooled mean differences (MD), risk ratios (RR) and proportions with 95% confidence intervals (CI) to calculate the overall effect size.



https://www.frontiersin.org/research-topics/5914/molecular-bridges-between-hematology-and-inflammation



RESULTS

The search yielded 3955 hits. All seven eligible studies reported on the upper GIB population. Restrictive transfusion did not increase the in-hospital- (RR:0.94; CI:0.46,1.94) and 30-day mortality (RR:0.68; CI:0.48,0.97). In-hospital- and 28 to 45-day rebleeding rate was also not higher with the restrictive modality CI:0.30,1.50; RR:0.75; (RR:0.67; CI:0.49,1.16, respectively). Results of individual studies showed a lower rate of transfusion reactions and posttransfusion intervention if the transfusion was started at a lower threshold. A haemoglobin threshold >80g/L may result in a higher untoward outcome rate.



CONCLUSION

In summary, restrictive transfusion proved non-inferior to liberal transfusion regarding all investigated clinical endpoints. The optimal restrictive transfusion threshold should be further investigated.

	R۵	strictive tr	ansfusion	l iheral tr	ansfusion					Rie	k of k	niae	GRADE
Study	No	Event	Total	Event	Total	RR of in-hospital mortality	RR 95°	%-CI Wei	ght A				
UGIB													
Blair et al. 1986		0	26	2	24	←	0.18 [0.01	; 3.66] 5.9	% •	•	+ +	? (<u>,</u>
Villarejo et al. 1999		0	14	0	13			43.72] 3.5			• •	?	#OO(
Kola et al. 2021		6	112	6	112	- 1		; 3.01] 43.3		?	+ +	<u>?</u> (Very lov
Overall (random) effect		6	152	8	149		_	; 2.24] 52.					
$I^2 = 0\% [0\%; 90\%]$								_					
VUGIB													
Hochain et al. 1996		6	43	6	47		1.09 [0.38	; 3.13] 47.3	3% ?		+ 4	? (
Overall (random) effect		12	195	14	196		0.94 [0.46	; 1.94] 100.	0%				
$I^2 = 0\% [0\%; 85\%]$							<u>-</u>	- -					
Residual heterogeneity: $I^2 = 0$?	% [0%; 90 ⁹	%]				0.01 0.1 0.51 2 10 50							
						Lower with restrictive Higher with re							
						Lower with restrictive Higher with re transfusion transfusi	estrictive						
b						•	estrictive						
Rest	trictive tra	ansfusion		ansfusion	Source of	transfusion transfusi	estrictive					bias	GRADE
Rest	trictive tra Event	ansfusion Total	Liberal tra Event	ansfusion Total	Source of bleeding	transfusion transfusi	estrictive ion	%-CI Wei	ght <i>i</i>			bias D E	
Rest						transfusion transfusi Follow-up	estrictive ion RR 95		9		CI		F !)
Study Rest	Event	Total	Event	Total	bleeding	transfusion transfusi Follow-up time RR of 30-day mortality	estrictive ion RR 95 0.56 [0.32	5 %-CI Wei 2; 0.97] 48.2 4; 1.57] 35.0	2% (CI	D E	F
Rest Study Villanueva et al. 2013 Kola et al. 2021	Event 23	Total 444	Event 41	Total 445	bleeding UGIB	transfusion transfusion Follow-up time RR of 30-day mortality 45 day	estrictive ion RR 95 0.56 [0.32 0.83 [0.44	2; 0.97] 48.2	2% - 5% ?		CI	D E	F
Rest Study Villanueva et al. 2013 Kola et al. 2021 Jairath et al. 2015	Event 23 10	Total 444 112 257	Event 41 12	Total 445 112	bleeding UGIB UGIB	Follow-up time RR of 30-day mortality 45 day 45 day	estrictive ion RR 95 0.56 [0.32 0.83 [0.44 1.00 [0.39	2; 0.97] 48.2 4; 1.57] 35.0 9; 2.57] 16.	2% 1 5% ? 1% 4		CI	D E	F
Rest Study Villanueva et al. 2013 Kola et al. 2021 Jairath et al. 2015 Overall (random) effect	23 10 14	Total 444 112	41 12 25	Total 445 112 383	bleeding UGIB UGIB	Follow-up time RR of 30-day mortality 45 day 45 day	estrictive ion RR 95 0.56 [0.32 0.83 [0.44 1.00 [0.39	2; 0.97] 48.2 4; 1.57] 35.0	2% 1 5% ? 1% 4		CI	D E	F
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	Nº of	Cortainty of the		Anticipated absolute effects			
Outcomes	participants (studies) Follow-up	Certainty of the evidence (GRADE)	Relative effect (95% CI)	Risk with liberal transfusion	Risk difference with restrictive transfusion		
Units of red blood cells transfused	1830 (5 RCTs)	⊕○○○ Very low	-		MD 1.35 units fewer (2.39 fewer to 0.32 fewer)		
In-hospital rebleeding	1893 (5 RCTs)	⊕○○○ Very low	RR 0.67 (0.30 to 1.50)	135 per 1,000	44 fewer per 1,000 (94 fewer to 67 more)		
Rebleeding follow-up: range 28 days to 45 days	927 (3 RCTs)	⊕○○○ Very low	RR 0.75 (0.49 to 1.16)	97 per 1,000	24 fewer per 1,000 (49 fewer to 16 more)		
Acute kidney injury	1504 (3 RCTs)	⊕○○○ Very low	RR 0.79 (0.61 to 1.03)	137 per 1,000	29 fewer per 1,000 (53 fewer to 4 more)		
Length of hospital stay	1140 (3 RCTs)	⊕○○○ Very low	-		MD 0.49 days lower (1.86 lower to 0.89 higher)		