

ITP Clinical Research Highlights: ISTH 2025

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Learning Objective: Describe the latest research about ITP presented at ISTH 2025 and its clinical relevance in real-world settings.

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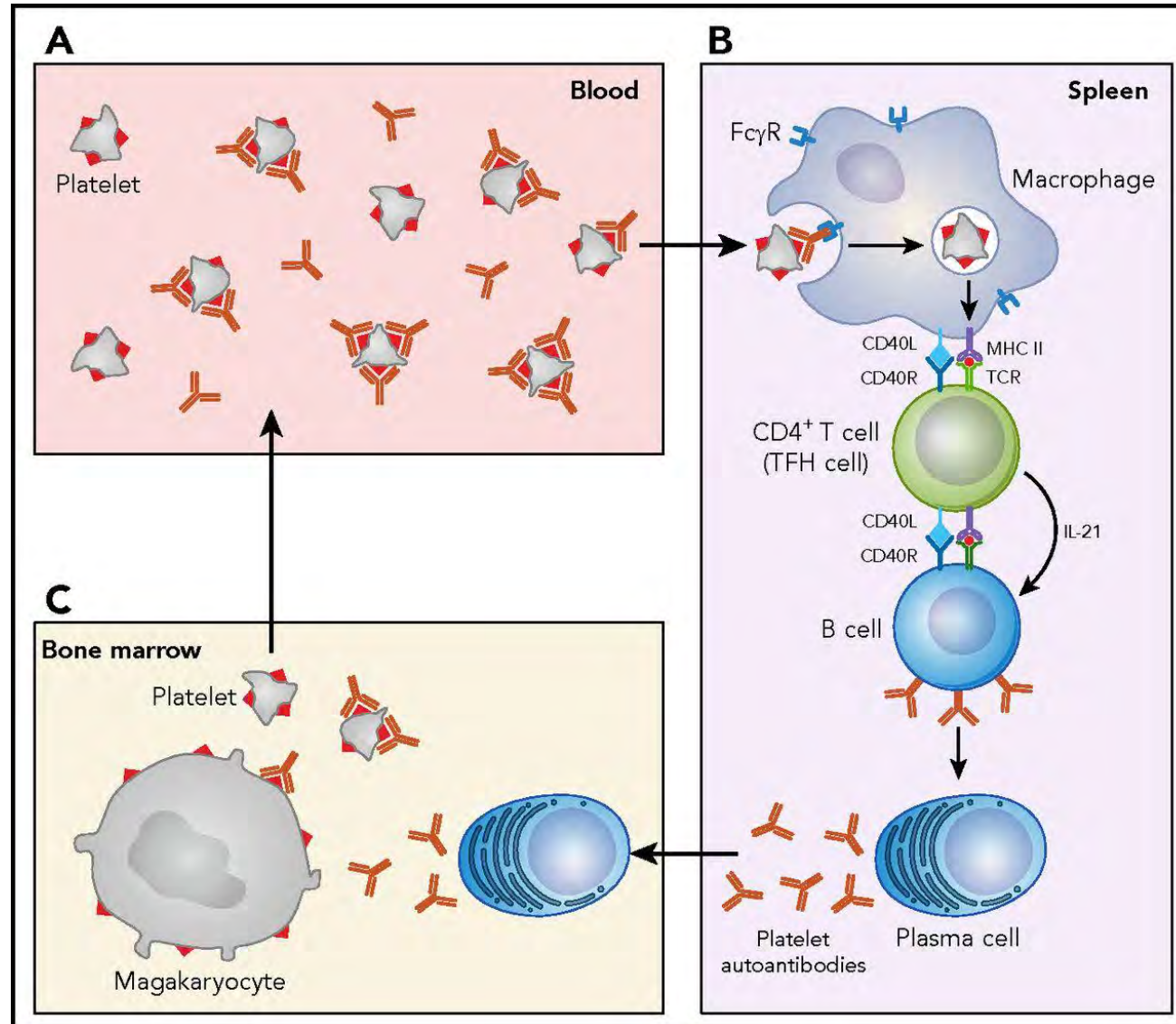
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Immune Thrombocytopenia (ITP)

- ITP is a common cause of isolated thrombocytopenia
- Caused by antibody mediated destruction of platelets
- ITP is a diagnosis of exclusion – need to rule out other causes of thrombocytopenia
 - History and physical
 - Labs
 - **No single diagnostic test**
- Several targeted therapies are in development (or recently approved), and their data was presented at ISTH 2025

Pathogenesis of ITP

Antibody mediated phagocytosis and destruction of platelets

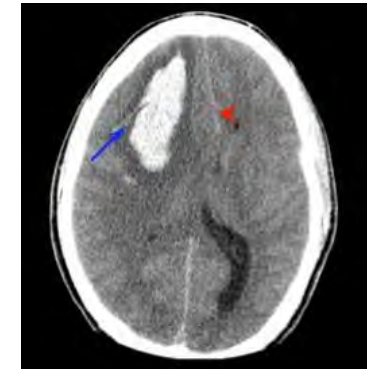
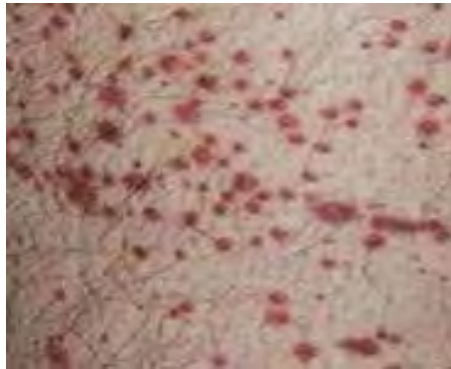


Some anti-platelet Ab can cause dysfunction and apoptosis of megakaryocytes in BM

PLUS
Autoreactive
cytotoxic T
cells

ITP – Clinical Presentation

- Bleeding is the primary symptom and depends on platelet count



- Some patients also report fatigue and poor health related quality of life

Clinical Management

ITP Treatment is Focused on Reducing Bleeding Risk

Factors that contribute to management decisions include:

- Extent of bleeding
- Comorbidities (e.g. cirrhosis) or medications predisposing to bleeding
- Potential interventions that may cause bleeding
- Side effects of specific therapies
- Activity and lifestyle
- Patient expectations/worry or anxiety about disease burden

First Line / Rescue Treatments



IVIg 2 g/kg
over 2 or 4 days



Steroids

- Prednisone 1 mg/kg with taper
- Dexamethasone 40 mg daily x 4 days

- Response rates are > 70-90% : lack of response to IVIG or steroids should make you reconsider diagnosis
- IVIG may have slightly quicker response (1-3 days vs. 2-14 days)
- Can use together for critically low platelets or bleeding

What If Steroids or IVIG Are Not Enough?

Rituximab



(anti-CD20 on B cells,
antibody production)

Thrombopoietin mimetic



Increase platelet
production

Splenectomy



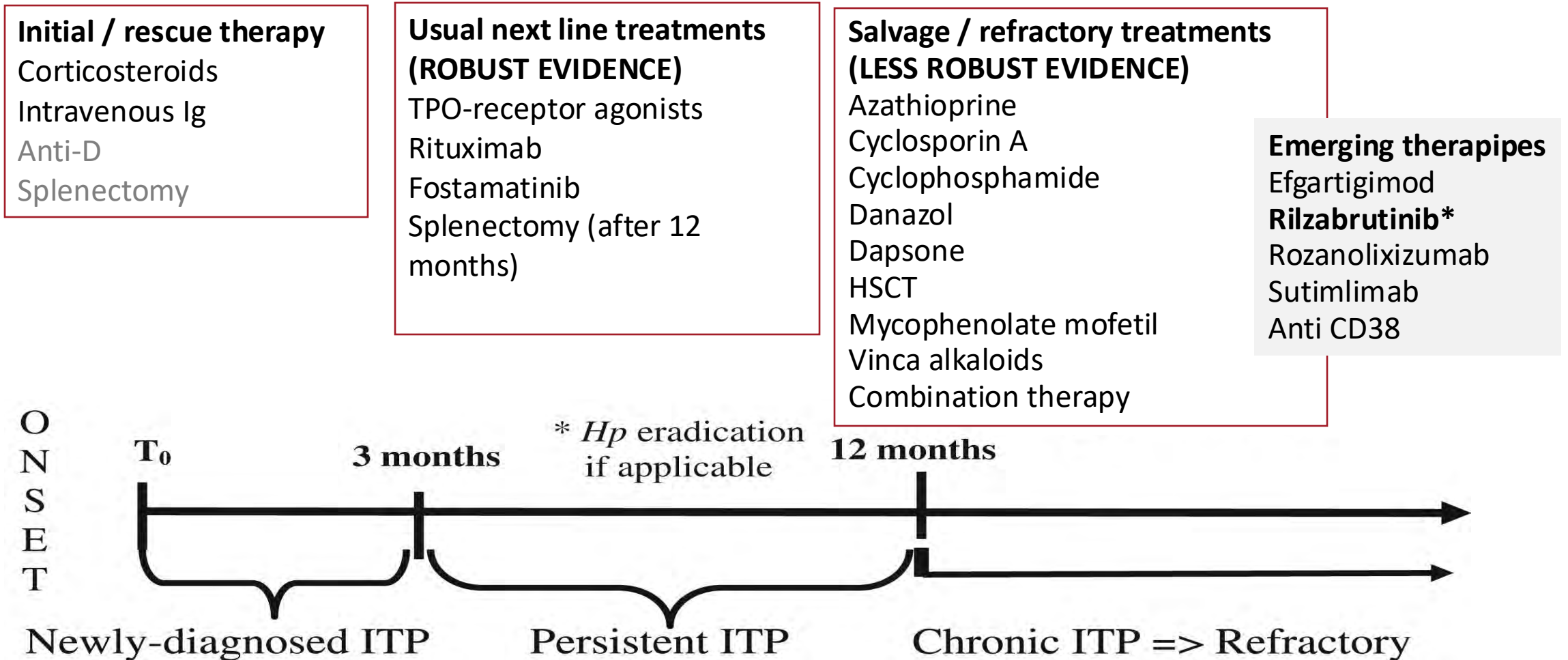
Remove site of
platelet destruction



All other immunosuppression, fostamatinib, etc.
Combination therapy

- No clear best treatment – no head to head comparison in RCTs
- Individualize treatment

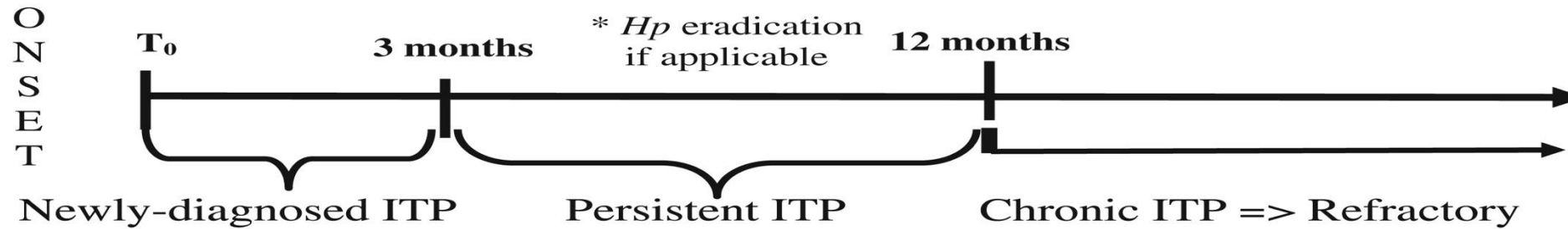
Treatments Used in Different Phases of ITP



*Approved in August, 2025 for treating adults with ITP

Neunert CE, et al. *Blood*. 2011;117(16):4190-207. Neunert CE, et al. *Hematology Am Soc Hematol Educ Program*. 2018;2018(1):568-575. Provan D, et al. *Blood*. 2010;115(2):168-186. Salama A. *Expert Opin Emerg Drugs*. 2017;22(1):27-38. Dou X, Yang R. *Expert Rev Hematol*. 2019;12(9):723-732.

Unmet Needs in Different Phases of ITP



- Steroid side effects
- Low rates of durable response with first line therapies

- Fatigue
- Poor quality of life

- Adverse effects of treatments

- Lack of well tolerated treatment options for refractory ITP that lead to durable responses

Case Example

A 38 yo M presents with history of relapsed primary ITP, most recently treated with fostamatinib, presents with platelet count of $12 \times 10^9/L$. He responds to corticosteroids and IVIG. He has previously received rituximab, romiplostim, eltrombopag, avatrombopag, mycophenolate, and cyclosporin without response. He prefers an oral treatment.

You recommend:

- a) Splenectomy due to lack of effective oral agents
- b) Rilzabrutinib (recently approved)
- c) Lanalumab (once available)
- d) Daratumumab

Platelet responses per IWG criteria for LUNA3 rilzabrutinib vs placebo in primary ITP patients.

Ghanima W et al. Presented at: 33rd Congress of the International Society on Thrombosis and Haemostasis; June 21–25, 2025; Washington, D.C.

Kuter DJ et al. Efficacy and safety of oral bruton tyrosine kinase inhibitor (BTKi) rilzabrutinib in adults with previously treated immune thrombocytopenia (ITP): A phase 3, placebo-controlled, parallel-group, multicenter study (LUNA 3). *Blood*. 2024;144 (Supplement 1): 5.

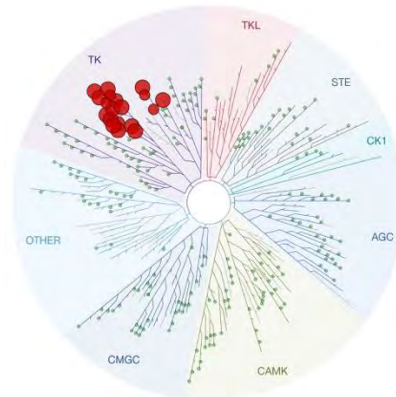
Rilzabrutinib - Novel Oral BTK Inhibitor for ITP

Pathophysiologic Mechanisms in ITP

Effect of
BTK
Inhibition

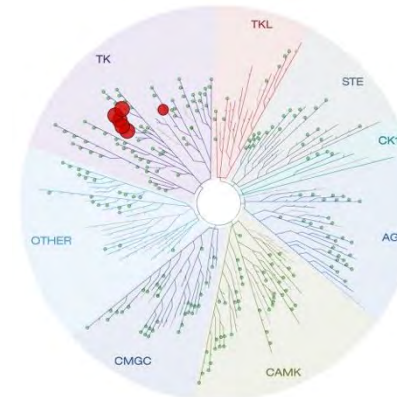
B cells, plasma cells	Monocyte, macrophage	Mast cells, basophils	Neutrophils	T cells
Blocks B-cell receptor Inhibits plasma cell differentiation and antibody production	Blocks IgG-mediated Fc γ R activation, phagocytosis, inflammatory mediators	Blocks IgE-mediated Fc ϵ R activation and degranulation	Inhibits activation, adhesion, recruitment, oxidative burst	No effect
BTK inhibition				

Ibrutinib Kinase Selectivity



**21 kinases
inhibited
>90%**

Rilzabrutinib Kinase Selectivity



**6 kinases
inhibited
>90%**

More selective – no
inhibition of platelet
function

LUNA 3: Study Design

- Multicenter, double-blind, placebo-controlled, randomized phase III trial

*Stratified by splenectomy status
and severity of thrombocytopenia*

Adults aged ≥ 18 yr with persistent or chronic primary ITP; prior IVIG/anti-D or CS (not sustained); platelet count $< 30 \times 10^9/L$; stable concomitant CS and/or TPO-RA allowed
(N = 202)

Double-blind period (24 wk)

Rilzabrutinib 400 mg BID*
(n = 133)

Placebo
(n = 69)

Open-label period (28 wk)

Rilzabrutinib
400 mg BID

Long-term extension

Rilzabrutinib
400 mg BID

*At 13 wk, nonresponders could discontinue or proceed to open-label rilzabrutinib.

- **Primary endpoint:** durable response at 25 Wk (defined as plt count $\geq 50 \times 10^9/L$ for $\geq 2/3$ of the last 12 weekly visits without rescue therapy)
- **Key Secondary endpoints:** initial plt response (plt count $\geq 50 \times 10^9/L$ or ≥ 30 to $< 50 \times 10^9/L$ and doubled from baseline); use of ITP rescue therapy, effect on Wk 13 fatigue and Wk 25 bleeding, TEAE

LUNA 3: Baseline Characteristics

Characteristic	Rilzabrutinib (n = 133)	Placebo (n = 69)
Median age, yr (range)	47 (18-80)	46 (19-79)
Female, n (%)	78 (59)	49 (71)
Median duration of ITP, yr (range)*	8.1 (0.3-52.2)	6.2 (0.3-35.8)
Median baseline platelet count, x 10 ⁹ /L (range)	15 (1-32)	15 (1-54)
Median number of prior ITP therapies, n (range)	4 (1-15)	5 (1-12)
▪ ≥5 prior therapies, n (%)	57 (43)	36 (52)
Prior splenectomy, n (%)	37 (28)	19 (28)
Prior TPO-RA, n (%)	88 (66)	51 (74)

*Average first and second qualifying screening platelet counts and study Day 1 platelet count.

LUNA 3: Efficacy

Parameter	Rilzabrutinib (n = 133)	Placebo (n = 69)	P Value
Durable response at Wk 25 (platelet count $\geq 50 \times 10^9/L$ for $\geq 2/3$ of the last 12 weekly visits without rescue therapy), %	31 (23%)	0	<.0001
Initial platelet response (platelet count $\geq 50 \times 10^9/L$ or ≥ 30 to $< 50 \times 10^9/L$ and doubled from baseline), n (%)	85 (65%)	23 (33%)	
Median time to platelet response, days	15	50	
Median duration of platelet response, wk	12	2	<.0001

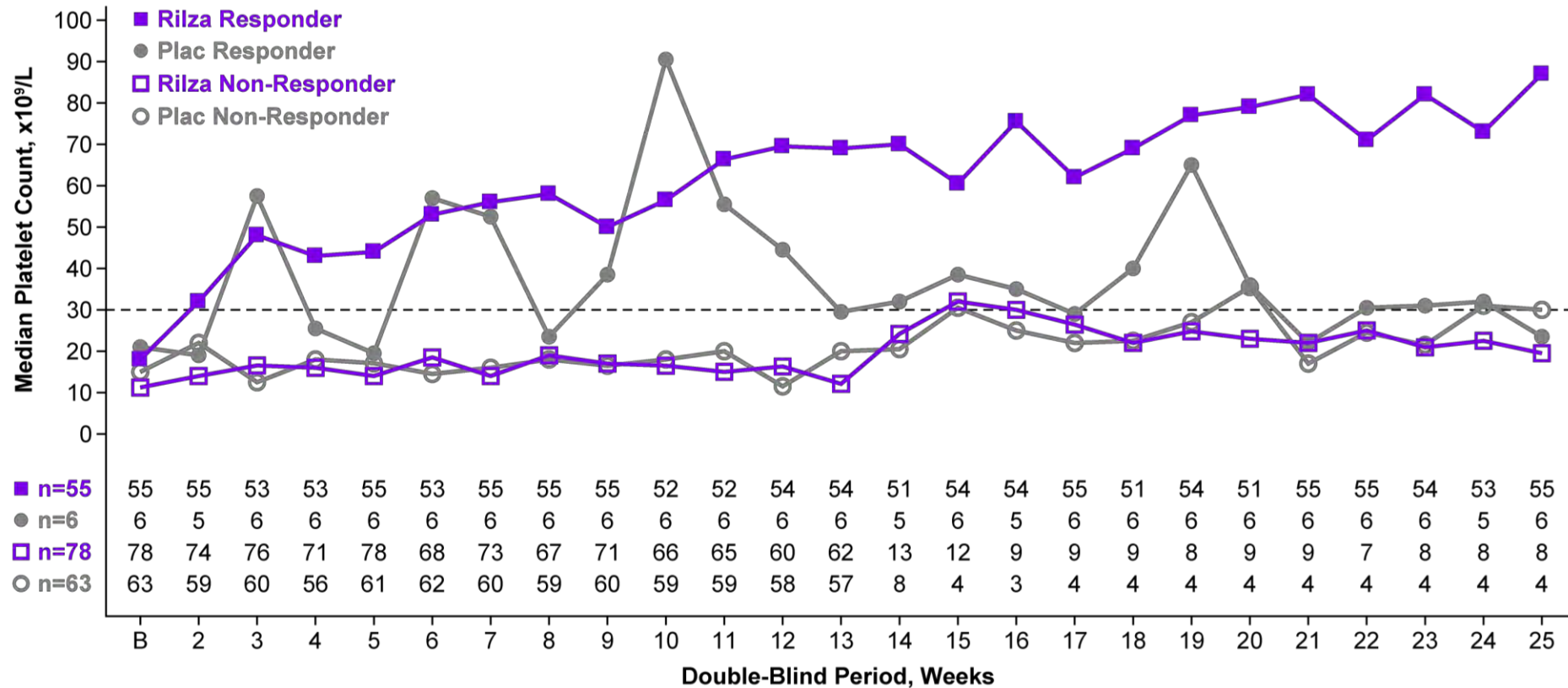
Rilzabrutinib vs Placebo, IWG-Defined Platelet Response

- **Durable IWG response** = platelet count $\geq 30 \times 10^9/L$ and at least doubled from baseline in the absence of bleeding for $\geq 50\%$ of assessments during double-blind and open-label periods

Double-Blind Period	Rilzabrutinib	Placebo
Double-blind treatment (p<0.0001)	55/133 (41%)	6/69 (9%)
Number of prior ITP therapies		
1-4	16/34 (47%)	2/13 (15%)
≥ 5	39/99 (39%)	4/56 (7%)
Open-Label Period		
All open-label pts	100/180 (56%)	-
Initial double-blind treatment		
Rilzabrutinib	61/115 (53%)	-
Placebo	39/65 (60%)	-
Number of prior ITP therapies		
1-4	23/40 (58%)	-
≥ 5	77/140 (55%)	-
Double-Blind or Open-Label Period		
Initial double-blind assignment		
Rilzabrutinib	73/115 (63%)	-
Number of prior ITP therapies		
1-4	20/27 (74%)	-
≥ 5	53/88 (60%)	-

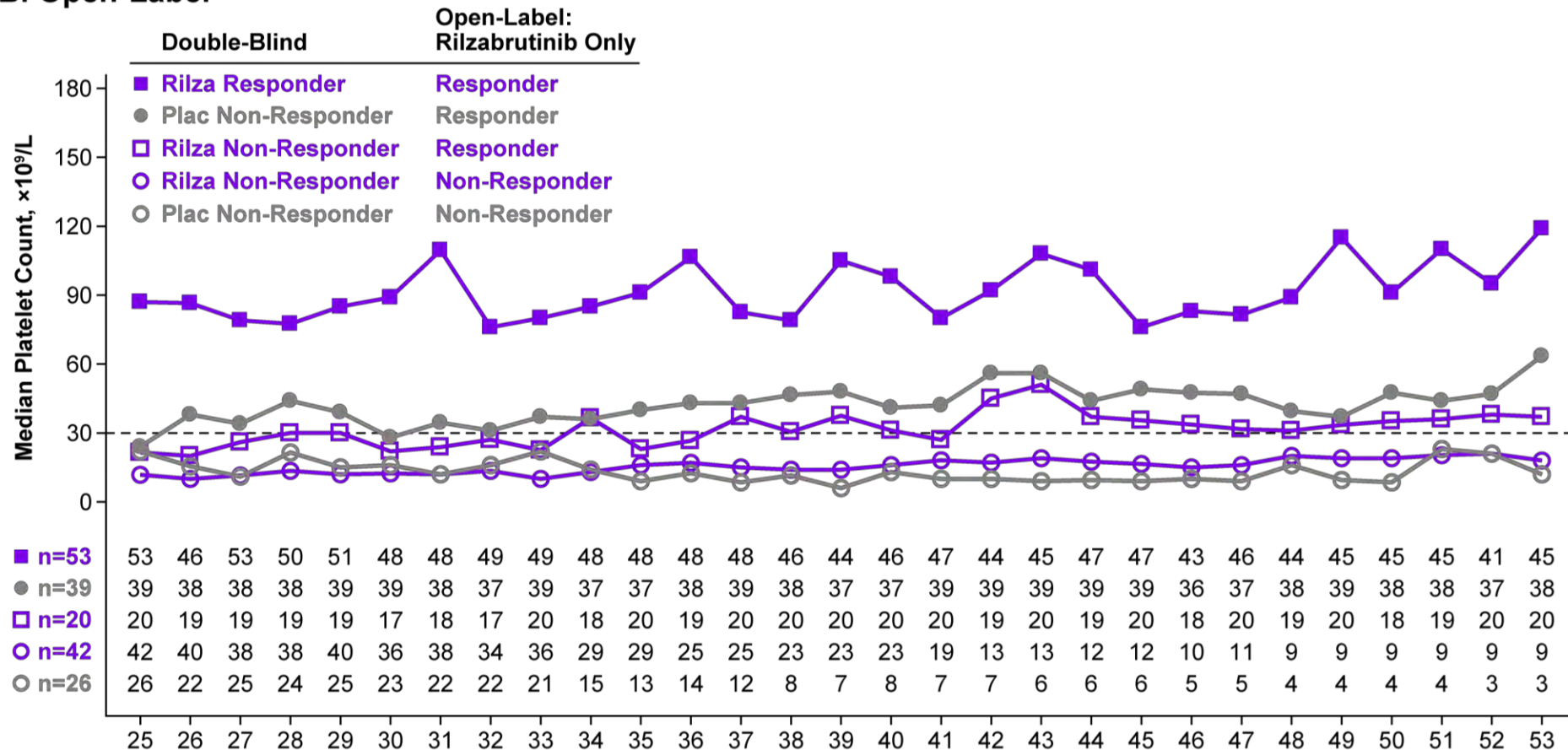
Median Platelet Counts During the Double-blind Period (IWG Durable Response Status)

A. Double-blind



Median Platelet Counts During the Open Label Period (IWG Durable Response Status)

B. Open-Label



2552 Improved Health-Related quality of Life (HRQoL) with Oral Bruton Tyrosine Kinase Inhibitor (BTKi) Rilzabrutinib Vs Placebo in Adults with Previously Treated Immune Thrombocytopenia (ITP): Phase 3 Luna 3 Multicenter Study

Program: Oral and Poster Abstracts

Session: 311. Disorders of Platelet Number or Function: Clinical and Epidemiological: Poster II

Hematology Disease Topics & Pathways:

Research, Bleeding and Clotting, Adult, Platelet disorders, Diseases, Thrombocytopenias, Immune mechanism, Biological Processes, Study Population, Human

Sunday, December 8, 2024, 6:00 PM-8:00 PM

Waleed Ghanima, MD, PhD¹, Howard A. Liebman, MD, MA², Yu Hu^{3*}, Yoshitaka Miyakawa, MD^{4*}, Nichola Cooper, MD^{5*}, Güray Saydam, MD^{6*}, Marie Luise Hütter-Krönke, MD^{7*}, Sylvain Audia^{8*}, Mengjie Yao^{9*}, Ahmed Daak, MD, PhD, MSc, DPM/MFPM¹⁰, Imene Gouia, PharmD, MSc Health Economics^{11*}, Matias Cordoba, MD^{12*} and David J Kuter, MD, DPhil¹³

LUNA 3: Secondary Endpoints

- Other endpoints significantly improved with rilzabrutinib vs placebo:
 - Longer duration of platelet response in all patients ($P < .0001$) and in responders ($P < .0001$)
 - Less use of rescue therapy ($P = .0007$)
 - **Decreased IBLS bleeding score at 25 Wk ($P = .0006$)**
 - Improvements in fatigue

Fatigue*	Rilzabrutinib	Placebo
Week 13	+8.0	-0.1% (p=0.01)
Week 25	+4.7	-7.3 (p=0.0003)

*from baseline to week 25

LUNA 3: Safety Summary

- Most safety events were of grade 1/2 (vs placebo)

Diarrhea	23%	4%
Nausea	17%	6%

*from baseline to week 25

- Rilzabrutinib arm: 2 rilzabrutinib-related SAEs
 - 1 grade 4 neutropenia event lasting 14 days (no infection or change in treatment)
 - 1 grade 3 serious AE of a pulmonary embolism in the lower left leg in a patient with multiple risk factors (treatment discontinued)

LUNA 3: Conclusions

- High response rate (65%) in previously treated ITP
 - 31% durable response at Wk 25 (plt count $\geq 50 \times 10^9/L$ for $\geq 2/3$ of the last 12 weekly visits without rescue therapy) vs 0% placebo ($P < .0001$)
 - 15 days to response (median)
- 83% response rate in 2nd line setting (higher than reported for rituximab)
- Rilzabrutinib also showed improvement for all secondary endpoints – bleeding, fatigue, QOL!
- Well tolerated with no BTK inhibitor class effects in adults with difficult to treat ITP

Real World

Real-world outcomes of avatrombopag treatment in primary ITP stratified by prior TPO-RA exposure.

Nagalla S et al. Presented at: 33rd Congress of the International Society on Thrombosis and Haemostasis; June 21–25, 2025; Washington, D.C.

TPO receptor agonists

Agent	Romiplostim ^{1,2a}	Eltrombopag ^{3,4a}	Avatrombopag ^{5,6}
MOA	<ul style="list-style-type: none"> • Unique platform peptibody • Binds to ligand binding site of TPO receptor • Activates platelet production 	<ul style="list-style-type: none"> • Small molecule • Binds to transmembrane portion of TPO receptor • Initiates signaling cascades that induce proliferation and differentiation from bone marrow progenitor cells 	
Initial Dose	SC injection: 1 mcg/kg given weekly	PO: 50 mg once daily	PO: 20 mg once daily
Food interactions	N/A	Yes	No
Hepatotoxicity	No	Yes – monitor hepatic function	No
FDA approved	Aug 2008	Nov 2008	June 2019
Indication	Immune thrombocytopenia (adults and children)	<ul style="list-style-type: none"> • Immune thrombocytopenia (adults and children) • Hepatitis C-associated thrombocytopenia • Severe aplastic anemia 	<ul style="list-style-type: none"> • Perioperative thrombocytopenia in CLD patients^b • Immune thrombocytopenia (adults)^c

CLD, chronic liver disease; MOA, mechanism of action; PO, orally by mouth; SC, subcutaneous; TPO, thrombopoietin. ^aAlso indicated for pediatric patients 1 year and older. ^bFDA approval for CLD in May 2018. ^cFDA approval for chronic ITP in June 2019. 1. Bussel JB, et al. *N Engl J Med.* 2006;355(16):1672-1681. 2. Romiplostim Package Insert. 2019. 3. Bussel JB, et al. *N Engl J Med.* 2007;357(22):2237-2247. 4. Eltrombopag Package Insert. 2019. 5. Bussel JB. *Br J Haematol.* 2018;183(3):342-343. 6. Avatrombopag Package Insert. 2019.

Avatrombopag Response in Primary ITP with vs without Prior TPO-RA Use

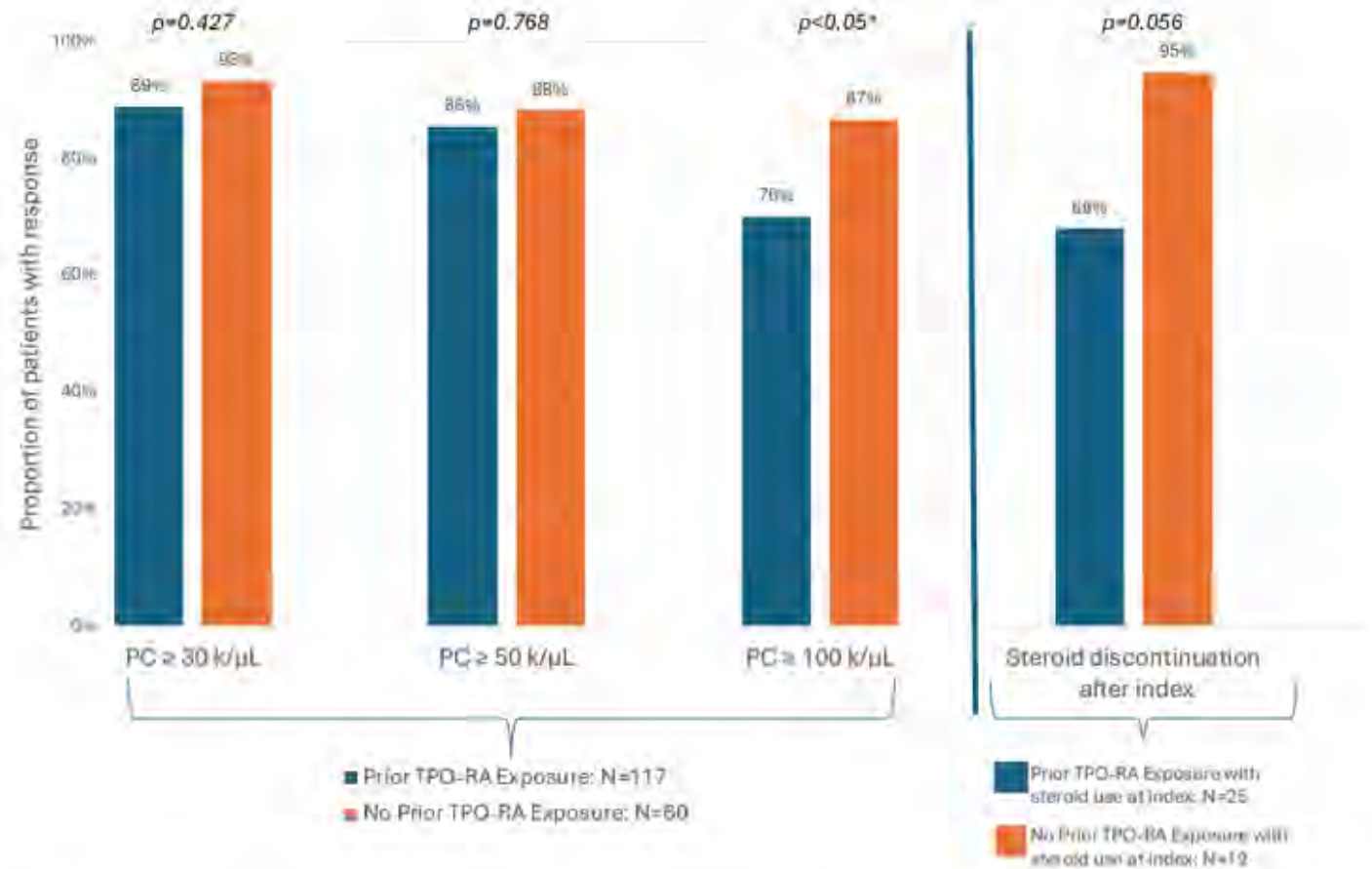
Assessed real-world avatrombopag (AVA) response in patients with primary ITP with or without prior TPO-RA exposure.

Retrospective multi-site chart review (n=177); evaluated platelet response thresholds and steroid discontinuation.

Measure	Prior TPO-RA (n=117)	No Prior TPO-RA (n=60)	P-value
Mean age (years)	58	52	<0.05
Median ITP duration (years)	2.8	0.4	<0.001
Platelet response $\geq 30\text{k}/\mu\text{L}$ (%)	89%	93%	0.427
Platelet response $\geq 50\text{k}/\mu\text{L}$ (%)	86%	88%	0.768
Platelet response $\geq 100\text{k}/\mu\text{L}$ (%)	70%	87%	<0.05
Steroid discontinuation after AVA (%)	68%	95%	0.056

Avatrombopag was effective regardless of prior TPO-RA use; higher $\geq 100\text{k}/\mu\text{L}$ response in TPO-RA-naïve patients.

Figure: AVA Response by Prior TPO-RA Exposure Status



Abbreviations: AVA, avatrombopag; PC, platelet count; TPO-RA, thrombopoietin receptor agonist; $\text{k}/\mu\text{L}$, thousand per microliter.

Note:

1. P-values compared proportions of patients using Chi-square tests.

Stepwise treatment protocol vs. TPO-RA-based second-line therapy for severe immune thrombocytopenia

Lin X et al. Presented at: 33rd Congress of the International Society on Thrombosis and Haemostasis; June 21–25, 2025; Washington, D.C.

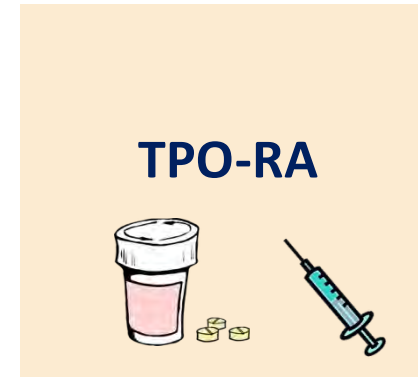
Stepwise treatment



High dose
dexamethasone



Rituximab



TPO-RA second line



High dose
dexamethasone



- Compared individualized, stepwise response-guided protocol to TPO-RA-based second-line therapy in children with persistent/chronic ITP (n = 143)

Stepwise Protocol vs TPO-RA for Pediatric p/cITP

- Stepwise protocol matched efficacy with fewer side effects, higher sustained off-treatment response, and lower cost.

Measure	Stepwise Group (SG)	TPO-RA Group (TG)	P-value
Response/remission rate	Similar	Similar	>0.05
Bleeding control	Similar	Similar	>0.05
Treatment-related side effects	9.0% (10 events in 111 pts)	39% (13 events in 33 pts)	<0.001
Sustained response off-treatment (SRoT)	74%	0%	—
Treatment cost (12-month, per kg)	\$68.26	\$384.76	<0.001

Updates on Novel Treatments

The Long-term Efficacy and Safety of Daratumumab in Children with chronic refractory ITP

Hu Y et al. Presented at: 33rd Congress of the International Society on Thrombosis and Haemostasis; June 21–25, 2025; Washington, D.C.

Evaluating Long-Term Daratumumab Efficacy in Pediatric Chronic Refractory ITP

- Single-center (n=11); daratumumab given weekly; follow-up up to 399 days; flow cytometry used to assess immune status.
- Daratumumab showed high initial and 3-month response rates, was well tolerated, and retreatment was effective after relapse.

Outcome	Value
Initial response (Week 4)	81.8% (9/11)
Response at 3 months	90.9% (10/11)
Sustained response at 6 months	42.8% (3/7)
Sustained response at 12 months	66.7% (2/3)
Bleeding score >1 at baseline vs 1 month	9 → 1 patient
Bleeding at 3 months	None
Relapse response to retreatment	Effective in 3/4 retreated pts
Safety	81.8% mild-moderate AEs during first dose

Short- and Long-Term Safety and Efficacy of CD38 Antibody Daratumumab in ITP

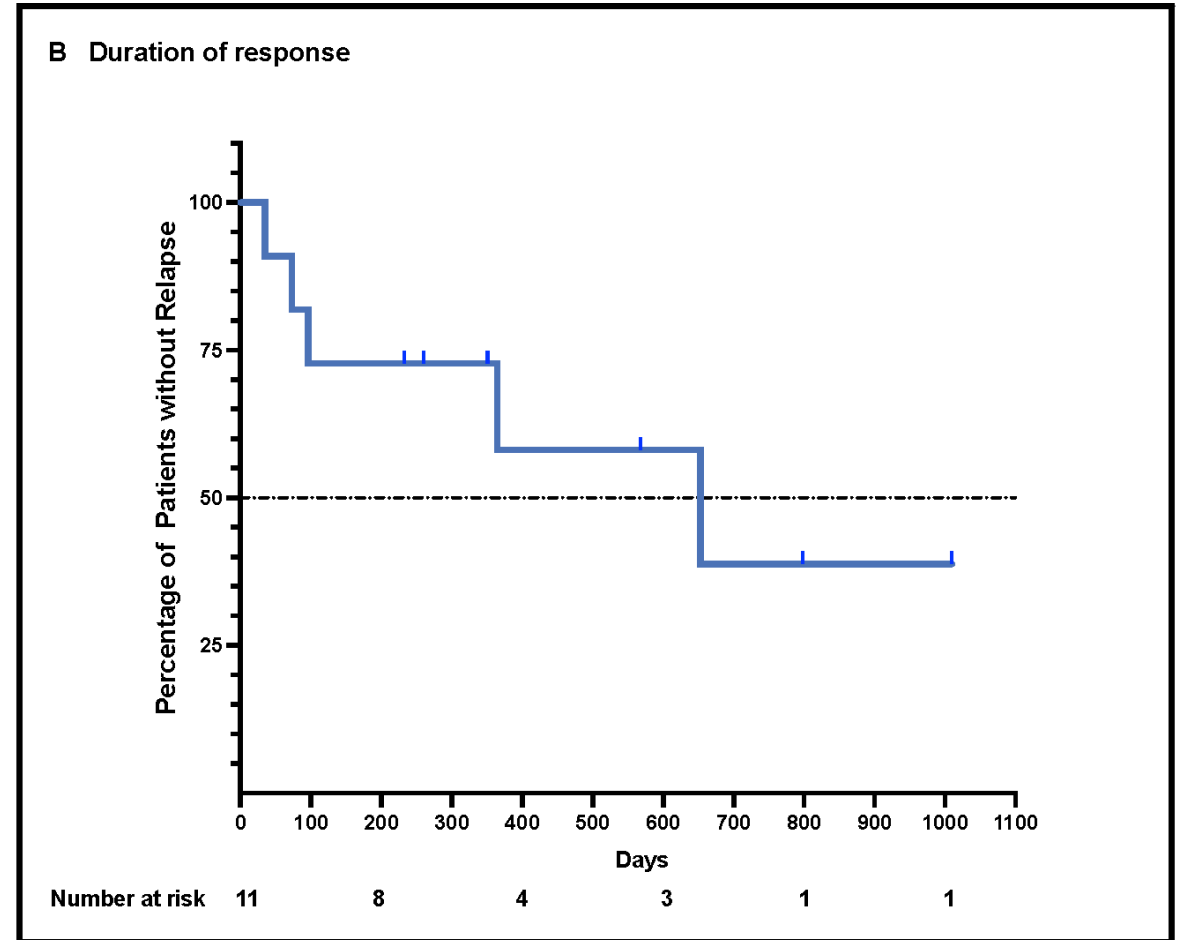
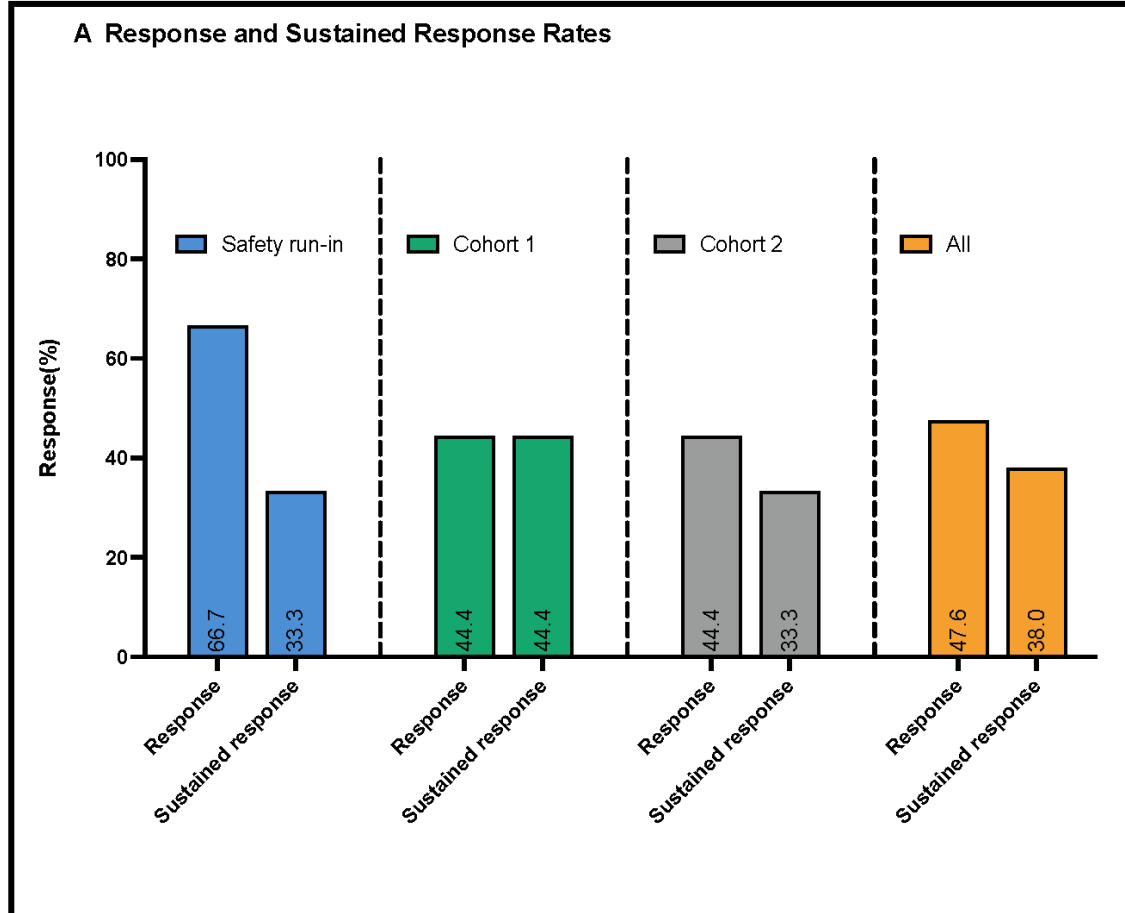
Tsykunoiva G et al. Presented at: 33rd Congress of the International Society on Thrombosis and Haemostasis; June 21–25, 2025; Washington, D.C.

Daratumumab for Refractory ITP: Phase 2 Efficacy and Safety

- a 3-patient safety run-in, 2 dosing cohorts received 8 and 10 daratumumab injections (1800 mg) for 8 or 12 weeks.
- Primary endpoint - two consecutive platelet counts $\geq 50 \times 10^9/L$ at week 12 for safety run-in/Cohort 1, and week 16 for Cohort 2.

	Total N = 21
Median disease duration	60.5 months
Median baseline platelet count	$17 \times 10^9/L$
Median prior therapies	4
Met primary endpoint	52.4% (11/21)
Sustained response (Week 24)	38% (8/21)
Median response duration	351 days
Still in response at study end	6 patients
Grade 3 AEs	2 patients (infusion reaction, SARS-CoV-2)
Most common AEs	Infections (38%), all mostly grade 1–2
Immunologic findings	\downarrow CD38+ cells; \downarrow Ig levels; no difference in autoantibodies

Response Rates and Duration of Response



Results from a phase 2 study on mezagitamab for chronic/persistent primary ITP

Kuter D et al. Presented at: 33rd Congress of the International Society on Thrombosis and Haemostasis; June 21–25, 2025; Washington, D.C.

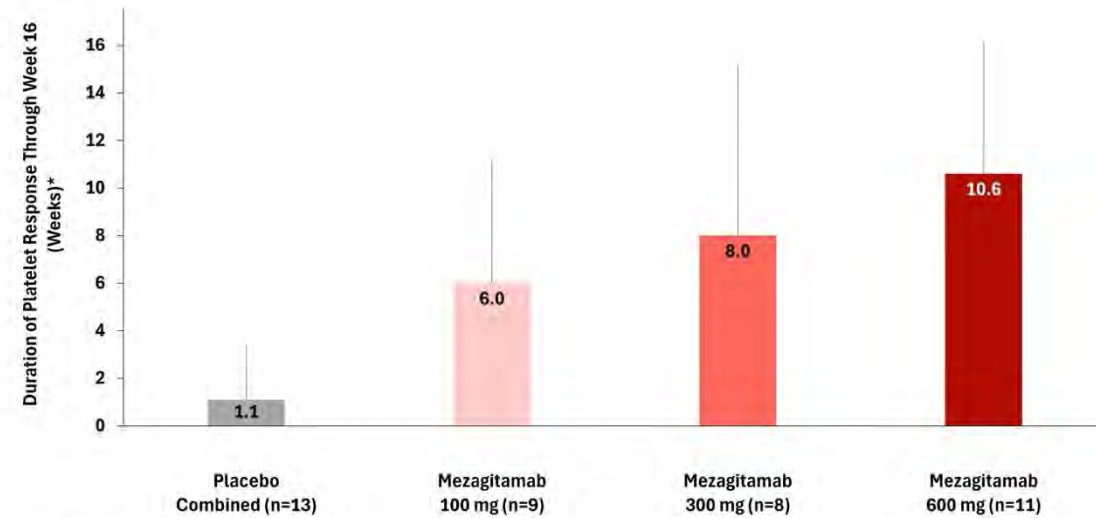
Phase 2 Results of Mezagitamab in Chronic ITP

- Assessed efficacy, durability of response, and quality of life with mezagitamab in chronic/persistent ITP.
- Randomized, placebo-controlled phase 2 trial (n=41); weekly SC mezagitamab for 8 weeks.
 - 25 randomized 1:1 : 1 to placebo vs 100 vs 300 mg
 - 15 randomized to 2:1 to mezagitamab 600 mg vs placebo
- All doses showed favorable safety; background ITP therapy permitted.
- Mezagitamab improved platelet response duration and ITP-related quality of life in a dose-dependent manner.

Results

Group	Mean Increase in Platelet Response Duration vs Placebo (weeks)	Clinically Meaningful ITP-patient assessment questionnaire (PAQ) Change
Mezagitamab 100 mg	+4.9	Yes
Mezagitamab 300 mg	+6.9	Yes
Mezagitamab 600 mg	+9.6	Yes
Placebo	—	No

Figure 1: Duration of platelet response through week 16.

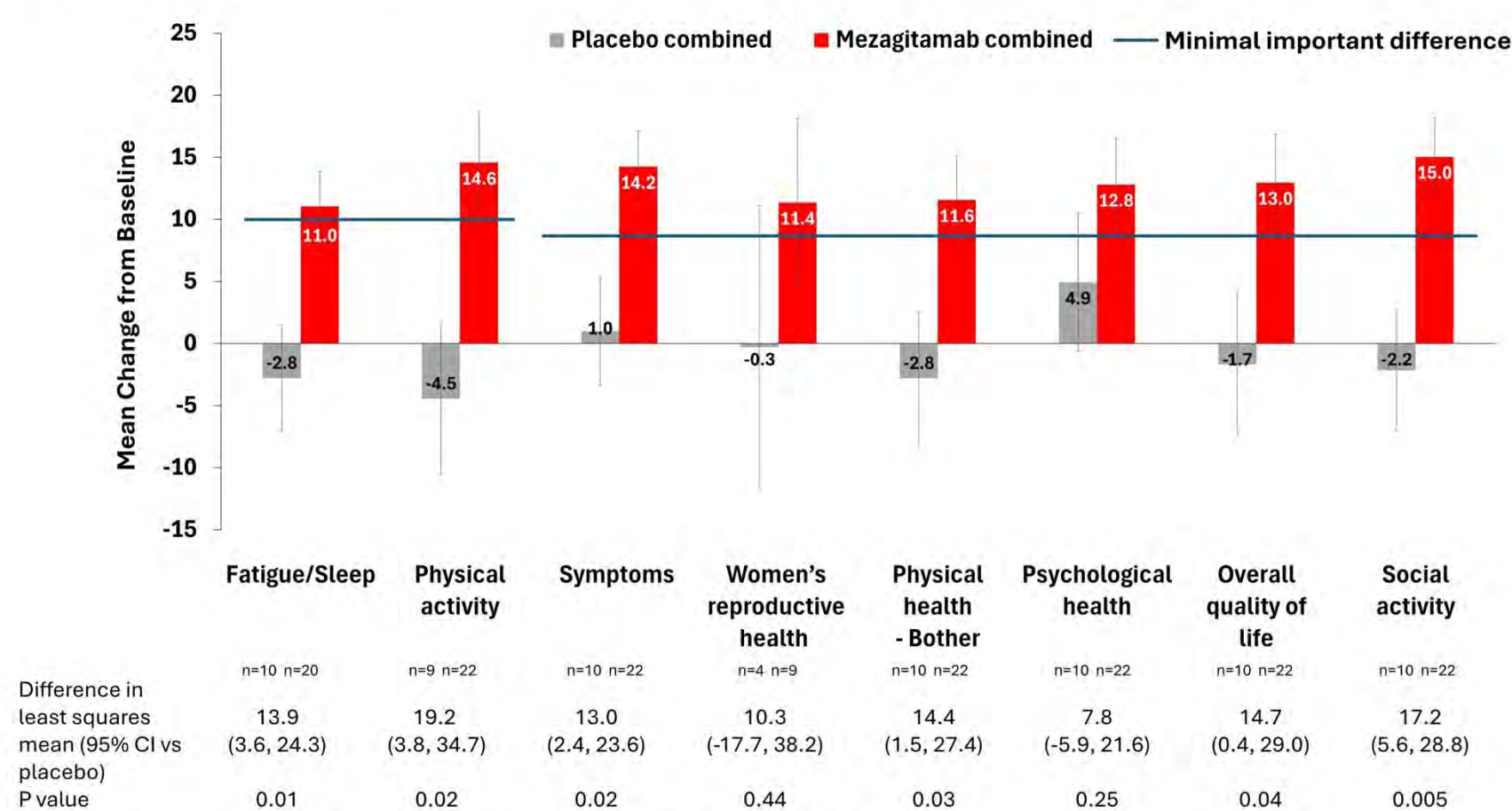


Data are presented as mean + SD.

* Duration of platelet response was defined as the number of weeks with platelet count $\geq 50,000/\mu\text{L}$.

ITP Patient Assessment Questionnaire (ITP-PAQ) Score Change from Baseline to Week 16

Figure 2: Change from Baseline in ITP-PAQ Scale Scores at Week 16.



The graphed data are presented as model-based mean and standard error of the mean.

Clinical Pearls

- Rilzabrutinib demonstrated durable responses based on IWG criteria, particularly in patients with fewer prior ITP therapies.
- Avatrombopag was effective regardless of prior TPO-RA exposure; greater $\geq 100\text{k}/\mu\text{L}$ responses were seen in TPO-RA-naive patients.
- A stepwise, response-guided protocol offered comparable efficacy to TPO-RAs with fewer adverse effects, higher off-treatment response rates, and reduced cost.
- Daratumumab showed strong initial and 3-month efficacy in pediatric CRITP; retreatment was successful after relapse.
- In adults, 52% treated with daratumumab achieved response; durable outcomes lasted up to 1010 days with good tolerability.
- Mezagitamab extended platelet response duration and improved quality of life in a dose-dependent manner.