GLP-1 agonists in Medical Dermatology

Review > J Dermatolog Treat. 2022 May;33(3):1299-1305. doi: 10.1080/09546634.2021.1882658. Epub 2021 May 3.

Efficacy of GLP-1rA, liraglutide, in plaque psoriasis treatment with type 2 diabetes: a systematic review and meta-analysis of prospective cohort and before-after studies

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Affiliations + expand

PMID: 33934692 DOI: 10.1080/09546634.2021.1882658

- 32 patients were enrolled in these studies of which 3 studies were prospective cohort study and 1 was a randomized control clinical trial (RCT)
- Compared the PASI, BMI, fasting plasma glucose, HbA1c, and the Dermatology Life Quality Index (DLQI) of patients that were Intervened by liraglutide before and after

Table 1. The characteristics of studies included in the meta-analysis.

Author		Ahern		Buysschaert	Faurschou		Xu	
year		2013		2014	2015		2019	
Study type		Prospective cohort study		Prospective case-series study	Random control clinical trail		Prospective cohort study	
Sample		7		7	11		7	
Gender (M/F)		5/2		5/2	7/4		6/1	
Age (year)		45 ± 11		56 ± 8	54 ± 14		60 ± 8	
Test period (Weeks)		10		16	8		12	
Treatment protocol		Subcutaneous injection, at a dose of 0.6 mg once daily for 2 weeks and then 1.2 mg once daily.		Subcutaneous injection, 0.6 mg once a day for 1 week, then usually 1.2 mg once a day	Subcutaneous injection,0.6 mg for 1 week, 1.2 mg the following week and 1.8 mg for the remaining treatment period		Subcutaneous injection, 0.6 mg every day, after 1 week increased the dosage to 1.2 mg per day, and finally increased to the maximum dosage 1.8 mg	
PASI 50%/75%		2/0					6/5	
PASI	Before	8.74 ± 9.22	Before	12.0 ± 5.9	Before	14.5 ± 7.2	Before	15.7 ± 11.8
	After	4.88 ± 4.25	After	9.2 ± 6.4	After	11.9 ± 4.65	After	2.2 ± 3
DLQI	Before	5.7 ± 3.9	Before		Before	8.7 ± 6.1	Before	21.8 ± 6
	After	3.3 ± 3.0	After		After	6.2 ± 5.25	After	4.1 ± 3.9
BMI (kg/m^2)	Before	45.67 ± 14.39	Before	32.0 ± 10.1	Before	37 ± 8.2	Before	23 ± 4
	After	43.78 ± 5.53	After	30.6 ± 9.1	After		After	21 ± 3
HbA1c (%)	Before		Before	7.5 ± 1.2	Before	5.4 ± 0.2	Before	8.1 ± 2.3
	After		After	6.5 ± 0.8	After	5.25 ± 0.195	After	6.4 ± 0.8
FBG (mmol/L)	Before	6.1 ± 0.74	Before		Before	5.9 ± 0.5	Before	6.2 ± 1.6
	After	5.8 ± 0.82	After		After	5.58 ± 0.425	After	5.5 ± 0.8

What does this mean?

- In patients with mild psoriasis liraglutide resulted in significant reductions in PASI score and fasting glucose did not significantly impact BMI and HgbA1C
- Problem: Small sample sizes in each study but this may indicate GLP-1 exerts effects outside of metabolic pathways involved in psoriasis

- GLP-1 is an incretin hormone produced in mucosal endocrine L cells, found in the epithelium of the intestinal tract with highest density in the ileum, and secreted in response to nutrients in the intestinal lumen
- GLP-1 robustly inhibits the secretion of glucagon from the alpha cells of pancreas, and the combined effects on insulin and glucagon secretion result in inhibition of hepatic glucose production
- Treatment of human umbilical endothelial cells with the GLP-1 agonist liraglutide results in anti-inflammatory actions including decreased expression of cytokines induced by tumor necrosis factor-a

Hattori Y, Jojima T, Tomizawa A, Satoh H, Hattori S, Kasai K, et al. A glucagonlike peptide-1 (GLP-1) analogue, liraglutide, upregulates nitric oxide production and exerts anti-inflammatory action in endothelial cells. Diabetologia 2010;53(10):2256–63

Faurschou A, Zachariae C, Skov L, Vilsbøll T, Knop FK. Gastric bypass surgery: improving psoriasis through a GLP-1-dependent mechanism? Med Hypotheses. 2011 Dec;77(6):1098-101.

Is it more than just TNF-alpha?

> J Dermatolog Treat. 2021 Nov;32(7):745-751. doi: 10.1080/09546634.2019.1708853.
Epub 2020 Jan 3.

Liraglutide improved inflammation *via* mediating IL-23/Th-17 pathway in obese diabetic mice with psoriasiform skin

Pin Chen [1], Lu Lin [1], Xiangjin Xu [1], Zhenting Zhang [1], Wei Cai [1], Zhulin Shao [1], Shengping Chen [1], Xiangqi Chen [1], Qiaoling Weng [1]

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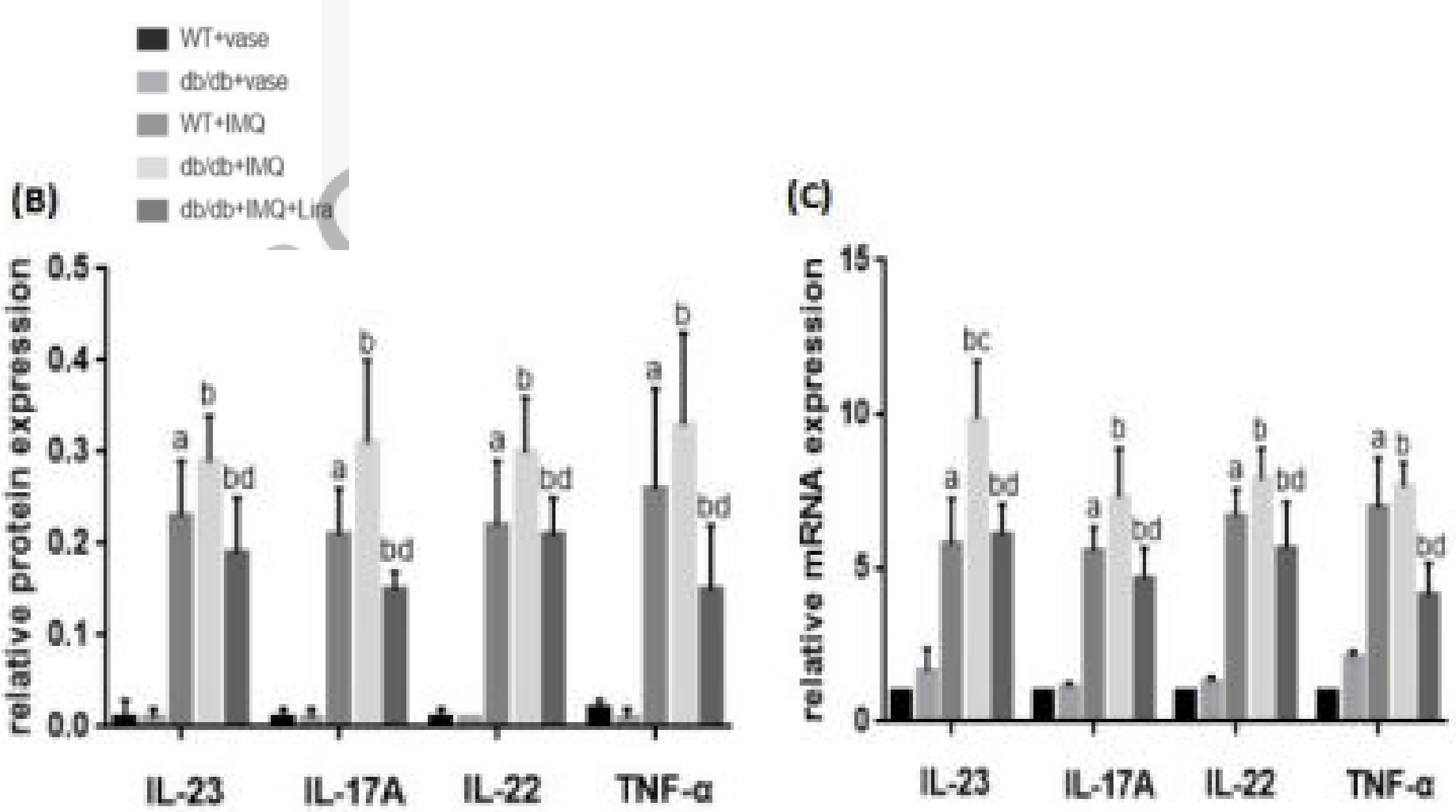
PMID: 31868553 DOI: 10.1080/09546634.2019.1708853

The control group received Vaseline cream (db/db mutant + Vase and WT + Vase), imiquimod (IMQ)-induction group (db/db + IMQ and WT + IMQ) and the liraglutide-treatment group (db/db + IMQ + Lira)

In the liraglutide treatment group mice were treated 4 weeks before psoriatic induction with imiquimod


WT+vase
db/db+vase
WT+IMQ
db/db+IMQ
db/db+IMQ+Lira
(B)
relative protein expression
0.0
0.1
0.2
0.3
0.4
0.5
a
b
bd
IL-23
IL-17A
IL-22
TNF-α
(C)
relative mRNA expression
0
5
10
15
a
bc
b
bd
IL-23
IL-17A
IL-22
TNF-α

But are GLP-1 receptors in the skin?

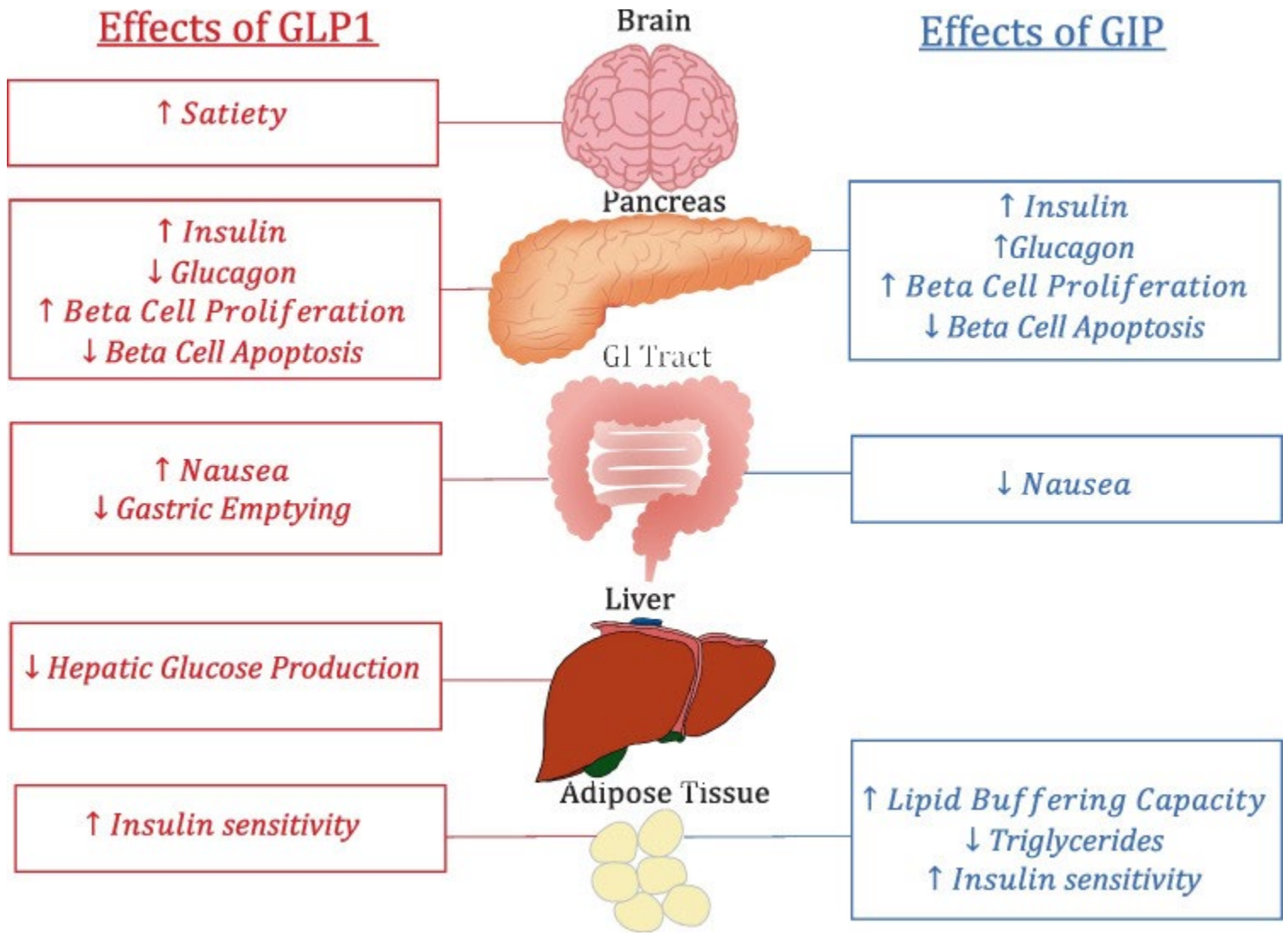
› Exp Dermatol. 2013 Feb;22(2):150-2. doi: 10.1111/exd.12081.

Increased expression of glucagon-like peptide-1 receptors in psoriasis plaques

Annesofie Faurschou, Jens Pedersen, Mette Gyldenløve, Steen S Poulsen, Jens J Holst, Jacob P Thyssen, Claus Zachariae, Tina Vilsbøll, Lone Skov, Filip K Knop

PMID: 23362875 DOI: 10.1111/exd.12081

- Three mm-punch skin biopsies were taken for gene expression analysis from six healthy volunteers and from affected and unaffected skin of six psoriasis patients
- Cultured human keratinocytes were either untreated or incubated with tumor necrosis factor- α (TNF-α), interferon-γ (IFN-γ) or a combination of TNF-α and IFN-γ for 48 h
- Total RNA was extracted from all the samples, reversely transcribed and analyzed for the expression of GLP-1R using real-time PCR
- Gene expression analysis showed expression of GLP-1Rs in 5/6 skin biopsies from psoriasis plaques, in 1/6 biopsies from unaffected psoriatic skin and in 1/6 biopsies from healthy skin
- No GLP-1R expression was found in either stimulated or unstimulated cultured human keratinocytes.

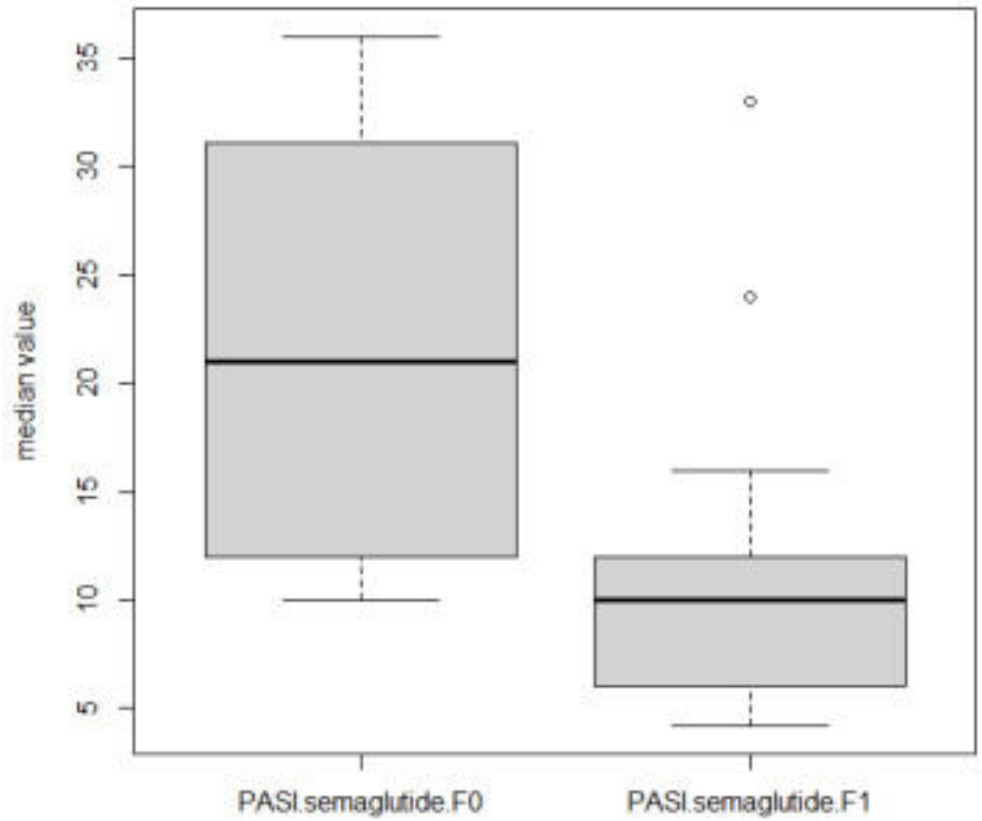


Andraos J, Muhar H, Smith SR. Beyond glycemia: Comparing tirzepatide to GLP-1 analogues. Rev Endocr Metab Disord. 2023 Dec;24(6):1089-1101.

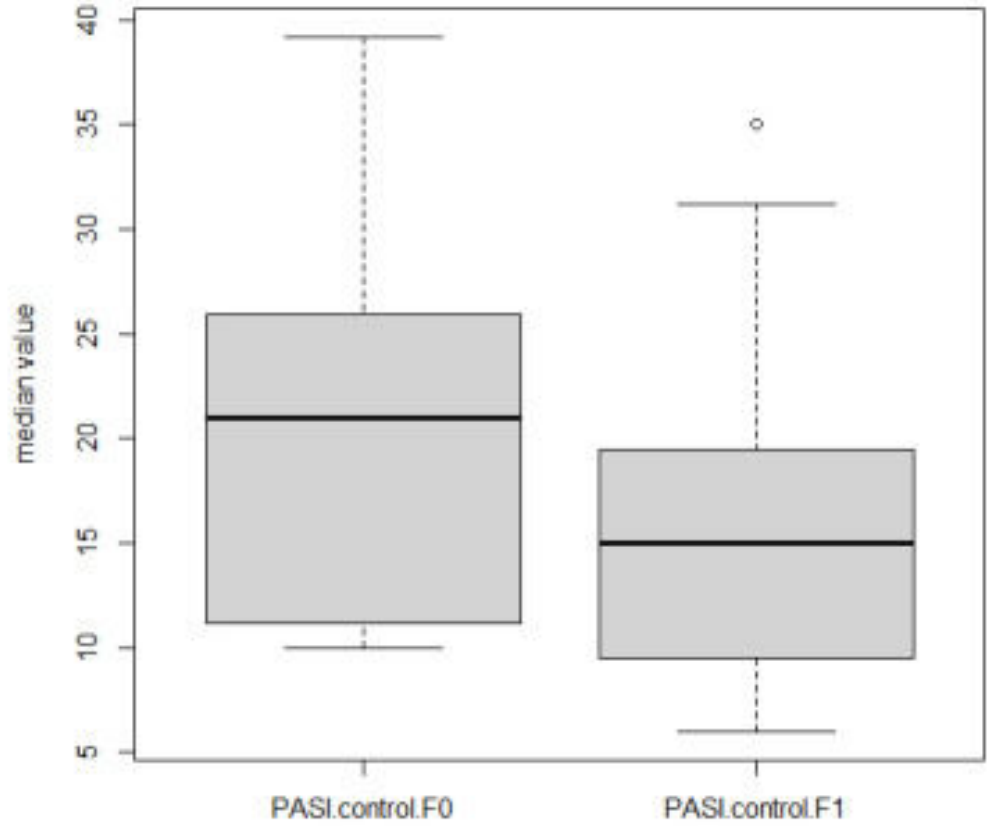
Randomized Controlled Trial > Biomolecules. 2025 Jan 1;15(1):46. doi: 10.3390/biom15010046.

Effects of Semaglutide Treatment on Psoriatic Lesions in Obese Patients with Type 2 Diabetes Mellitus: An Open-Label, Randomized Clinical Trial

Jelena Petković-Dabić [1 2], Ivana Binić [3], Bojana Carić [1 4], Ljiljana Božić [5], Sanja Umičević-Šipka [1 2], Nataša Bednarčuk [1], Saša Dabić [6], Mirna Šitum [7 8], Snježana Popović-Pejičić [1 4 9], Miloš P Stojiljković [1 10], Ranko Škrbić [1 9 10 11]



(a)



(b)

Parameters	F0	F1	*p*	F0	F1	*p*
Lipids						
Cholesterol (mmol/L)	5.2 ± 1.1	4.6 ± 1.2	0.2	5.1 ± 1.1	5.1 ± 1.2	0.5
Triglycerides (mmol/L)	1.8 (0.9)	1.5 (1.5)	0.3	1.6 ± 0.7	1.7 ± 1	0.4
HDL (mmol/L)	1.1 ± 0.2	1.07 ± 0.3	0.4	1.2 ± 0.3	1.2 ± 0.4	0.9
LDL (mmol/L)	3.6 ± 1	2.8 ± 0.9	0.03 *	3.6 ± 1.2	3.4 ± 1	0.2
Glucoregulation						
Glucose (mmol/L)	7.0 (3.2)	6.3 (1.4)	0.3	6.4 (3.7)	6.1 (1.1)	0.8
HbA1C (%)	7.3 (0.2)	6.1 (0.8)	0.02 *	7.2 (0.6)	6.3 (1.7)	0.001 **
Insulin (µIU/mL)	11.4 ± 7.5	10.8 ± 6.7	0.7	11 (20.4)	10.8 (8.7)	0.2
Uric acid (µIU/mL)	361.2 ± 97.9	358.6± 76.6	0.9	382.9 ± 83.2	399.2 ± 100.5	0.4
Homocysteine	9.44 ± 2.21	10.91 ± 2.84	0.15	10.07 ± 2.27	12.32 ± 5.09	0.08

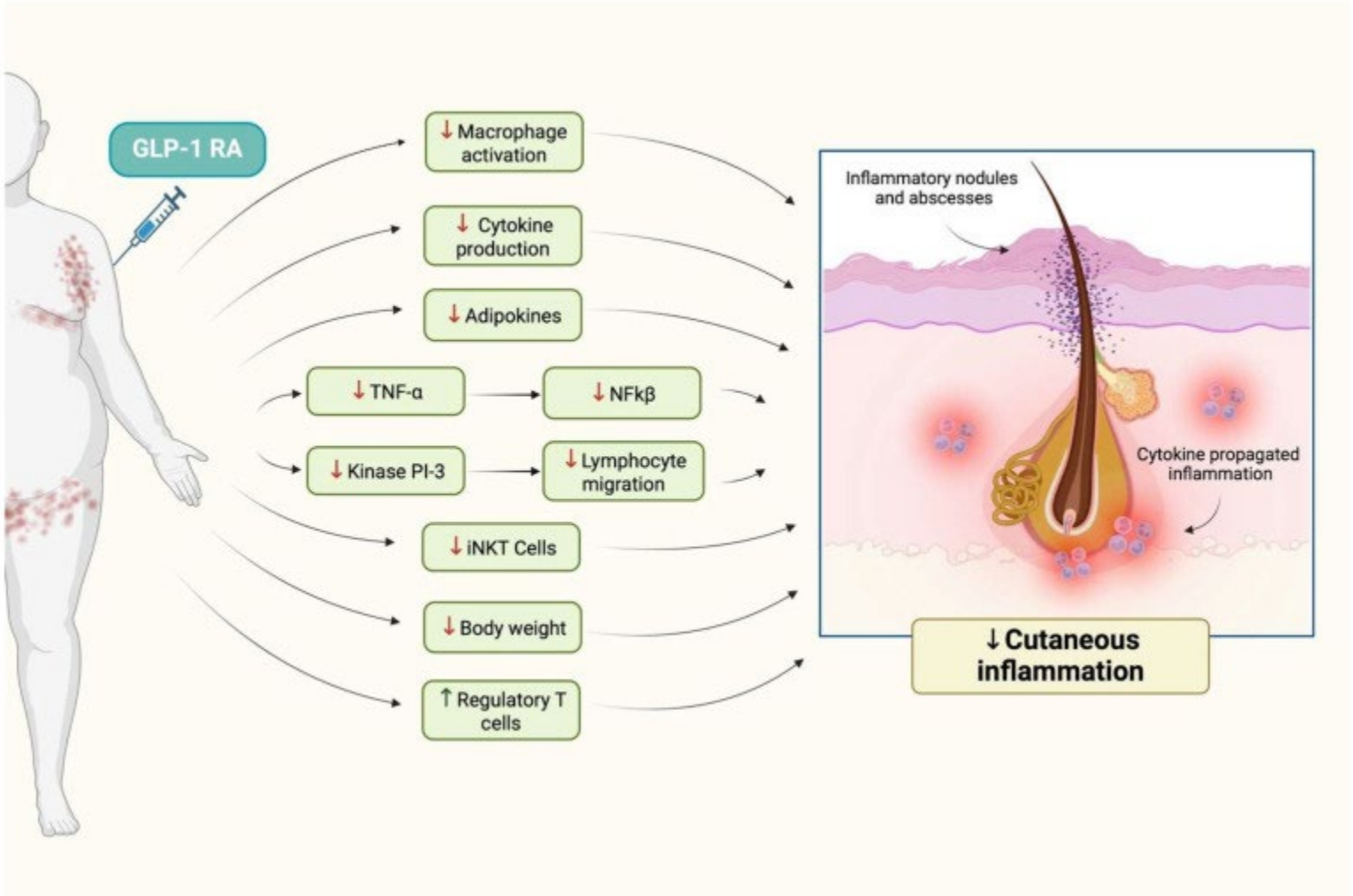
Review > J Clin Med. 2024 Oct 22;13(21):6292. doi: 10.3390/jcm13216292.

The Therapeutic Potential of GLP-1 Receptor Agonists in the Management of Hidradenitis Suppurativa: A Systematic Review of Anti-Inflammatory and Metabolic Effects

Piotr K Krajewski [1], Aleksandra Zło

Affiliations + expand

PMID: 39518431 PMCID: PMC115



Med Clin (Barc). 2024 Feb 9;162(3):118-122. doi: 10.1016/j.medcli.2023.11.007. Epub 2023 Dec 2.

Liraglutide for the treatment of obesity among patients with hidradenitis suppurativa

[Article in English, Spanish]

Joana Nicolau [1], Antoni Nadal [2], Pilar Sanchís [3], Antelm Pujol [3], Lluís Masmiquel [3], Cristina Nadal [2]

Affiliations + expand

PMID: 38044187 DOI: 10.1016/j.medcli.2023.11.007

- 14 patients with both HS and obesity were treated with liraglutide at a dose of 3 mg for 3 months
- Significant reductions in BMI (from 39.3 ± 6.2 to 35.6 ± 5.8; p = 0.002)
- Reduced waist circumference (from 121.3 ± 19.2 cm to 110.6 ± 18.1 cm; p = 0.01)
- Reduction in systemic inflammatory markers, including C-reactive protein (CRP) (from 4.5 ± 2.2 mg/L to 3.0 ± 2.1 mg/L; p = 0.04), homocysteine (from 16.2 ± 2.9 µmol/L to 13.3 ± 3.0 µmol/L; p = 0.005), and plasma cortisol (from 15.9 ± 4.8 µg/dL to 12.6 ± 4.5 µg/dL; p = 0.007)
- Severity of HS lesions was assessed using the Hurley Staging System, which showed a marked improvement from a mean score of 2.6 ± 0.5 to 1.1 ± 0.3 (p = 0.002).

Br J Dermatol. 2024 Sep 18;191(4):631-633. doi: 10.1093/bjd/ljae216.

Semaglutide for weight loss in people with obesity as an adjunctive treatment for hidradenitis suppurativa: its impact on disease control and quality of life

Daniel Lyons [1], Anusha Louly Nathan [1], Emily Pender [1], Gregg Murray [1], Conor Smith [2 3], Brian Kirby [1 2], Rosalind Hughes [1 2]

Affiliations + expand

PMID: 38771673 DOI: 10.1093/bjd/ljae216

- The study assessed the impact of semaglutide on disease control and quality of life in 30 patients with both obesity and HS
- The mean duration of semaglutide treatment was 8.2 months, with an average weekly dose of 0.8 mg
- The frequency of HS flares decreased from once every 8.5 weeks to once every 12.0 weeks, although this reduction did not reach statistical significance
- LOW doses can be anti-inflammatory!

JAAD Case Rep. 2024 Mar 6;52:101–102. doi: 10.1016/j.jdcr.2024.02.023

A case of recalcitrant hidradenitis suppurativa concomitantly treated with tirzepatide

Lina J Chan [a,*], Manjit Kaur [b], Benjamin H Kaffenberger [a]

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PMCID: PMC11421363 PMID: 39319185

Table I.

Patient's glycemic laboratory tests, body mass index, patient reported, and physician reported outcomes before and after tirzepatide therapy

	Before tirzepatide	3 mo after tirzepatide
Fasting blood sugar	179	95
Random blood sugar	220	108
HbA1C	10.1	5.4
Triglycerides	233	139
BMI	41.36	33.63
DLQI	14	3
VAS	3	1
HS-PGA	Moderate	Mild
HiSCR-sum of abscesses and inflammatory nodules	5	3

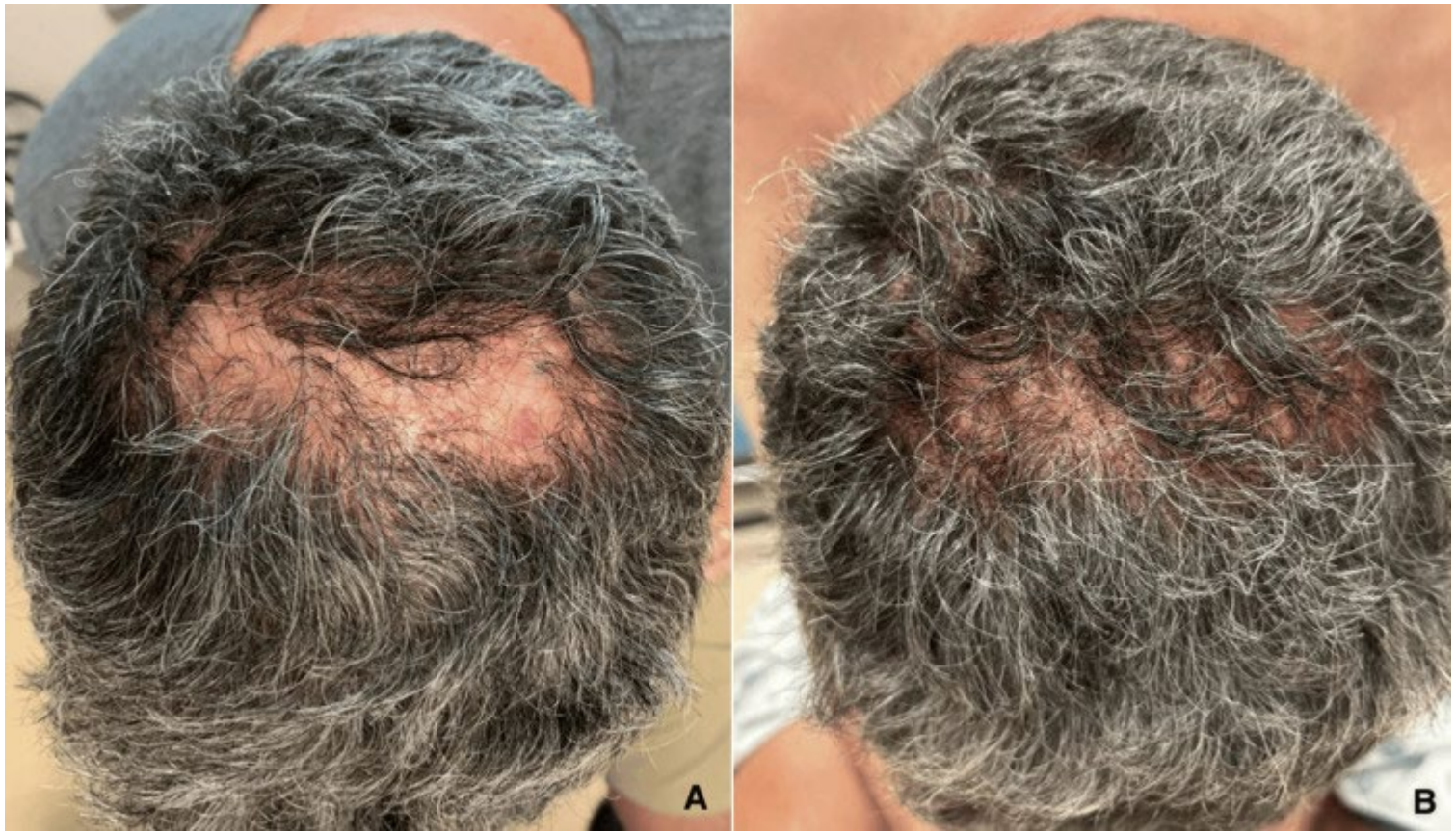
Cureus. 2024 Dec 23;16(12):e76267. doi: 10.7759/cureus.76267

Improvement of Recalcitrant Folliculitis Decalvans With Tirzepatide: A Case Report

Kali Morrissette [1], Stefan Hansen [2], Michelle Pavlis [2,3], John C Murray [2,✉]

Editors: Alexander Muacevic, John R Adler

PMCID: PMC11753719 PMID: 39845205



JAAD Case Rep. 2024 Jun 11;50:123–125. doi: 10.1016/j.jdcr.2024.06.001

Treatment of insulin resistance with tirzepatide leading to improvement of hair loss

Emily R Gordon [a], Sarah Musleh [b], Lindsey A Bordone [c,*]

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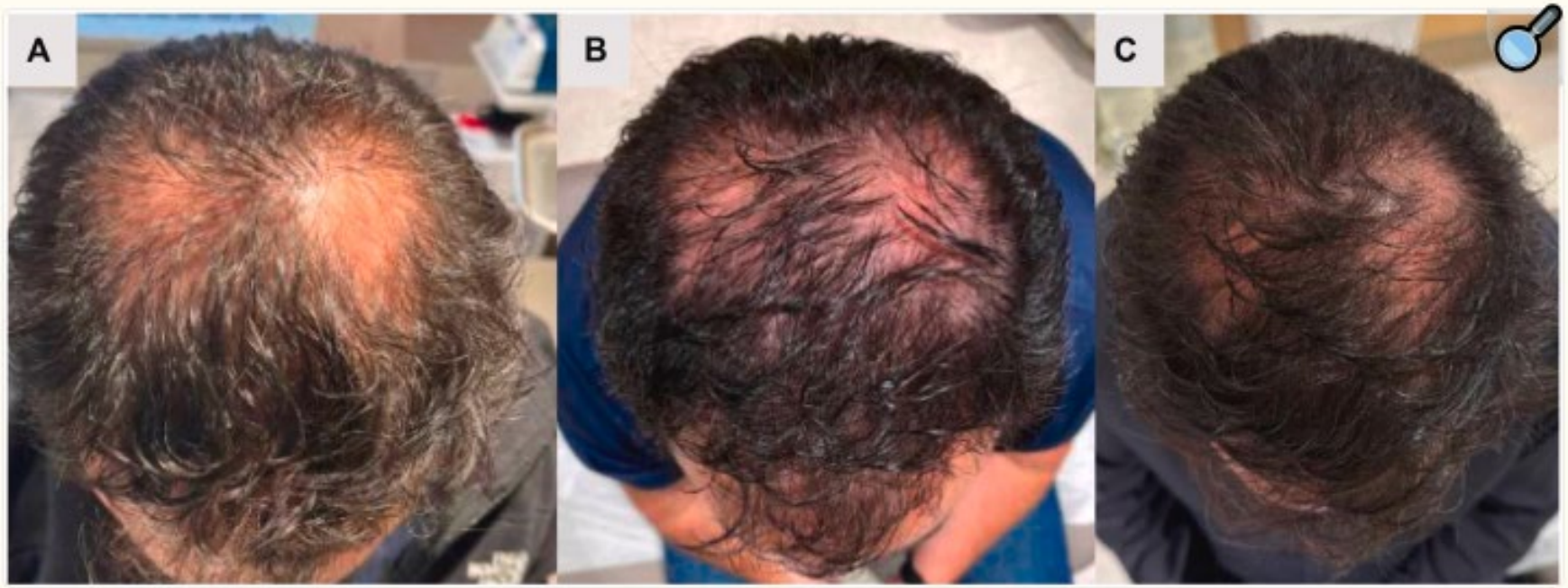
PMCID: PMC11318540

Fig 1.



The Lal GLP recipe for inflammatory skin diseases

- A) Check if they have a dx of DM, HTN, HLD, and assess BMI, weight
- → If they do and you DO NOT feel comfortable Rxing please refer to PCP or endocrinologist for tx
- If unsure of above check at baseline: HgbA1c, BMP, CRP, BP, AST/ALT
- Make sure no hx or FHx of MEN syndrome, medullary thyroid cancer
- Discuss risks of pulmonary aspiration, bowel obstruction, nonarteritic anterior ischemic neuropathy****

COUNSEL patients they still need to eat even if they don't feel the need (goal to maintain 1200 calorie diet)

How to dose

Ozempic Once Weekly Injection Schedule

Ozempic uses a scale-up dosage approach to reduce GI-related side effects. Process takes 3 sessions of independent 4-week cycles to get to the maintenance dose.

START THE EXPERIENCE

Starting dose (for 4 weeks)

MONTH 1

CONTINUE THE EXPERIENCE

For at least 4 weeks

MONTH 2

IF ADDITIONAL GLYCEMIC CONTROL IS NEEDED

For at least 4 weeks

For at least 4 weeks

For at least 4 weeks

Maximum dose

My best practices

- Semaglutide:
- 0.25mg X 4 weeks, 0.5mg X 4 weeks, then stay on 1mg weekly until goal is reached (IGA/PASI) and then go back to 0.25mg weekly or every 2 weeks
- Tirzepatide:
- 2.5mg X 4 weeks, 5mg X 4 weeks, and stay on 5mg until goal is reached and then work your way down
- Check Labs Q 3 months: HgbA1c, lipids, BMP, AST/ALT
- ***Refer to nutrition if amenable, discuss adequate 0.5mg-1mg/kg protein consumption to sustain muscle mass