



**UNIVERSITÄTS
KLINIKUM** FREIBURG

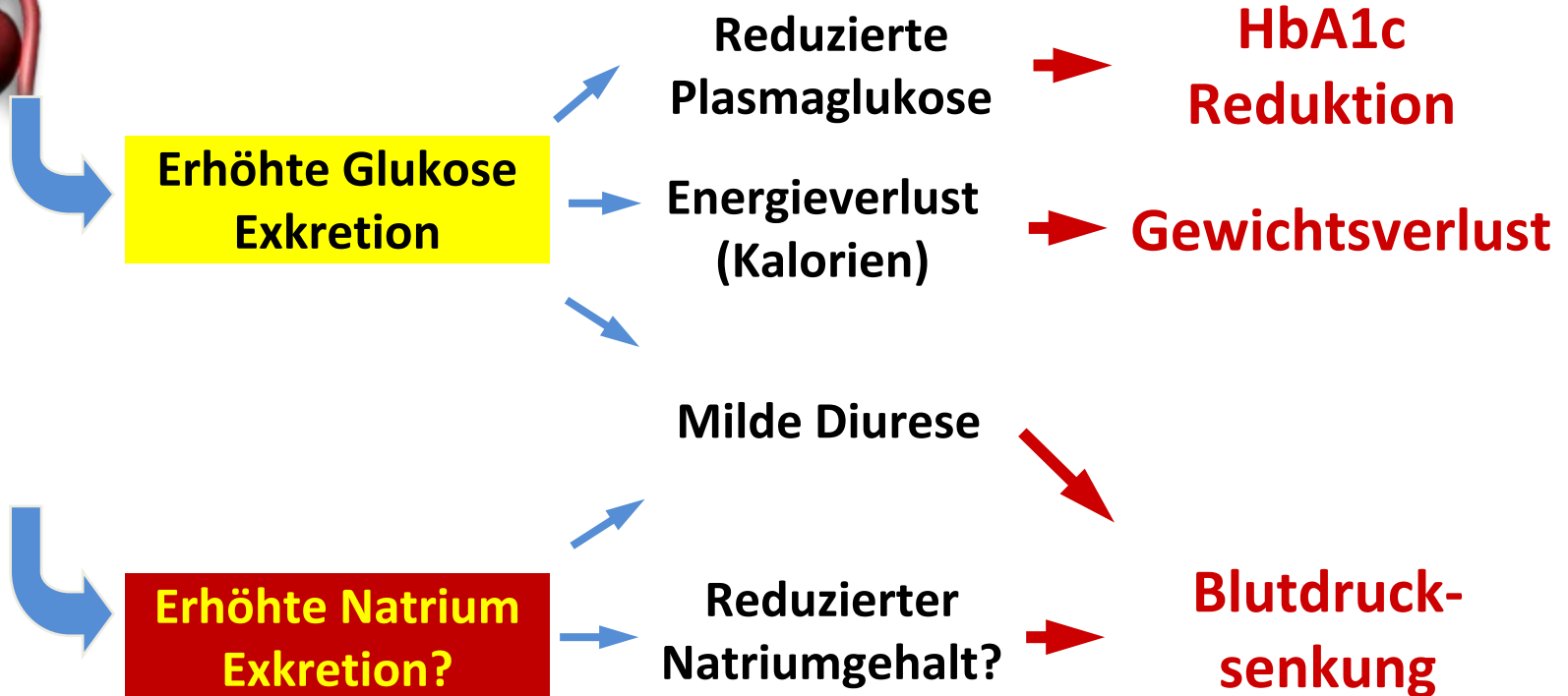
Neue Medikamentengruppen bei kardiovaskulärem Syndrom

SGLT2-Inhibitoren

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Innere Medizin II
Abteilung Endokrinologie und Diabetologie



Klinische Effekte von SGLT2 Inhibitoren aufgrund des Wirkmechanismus

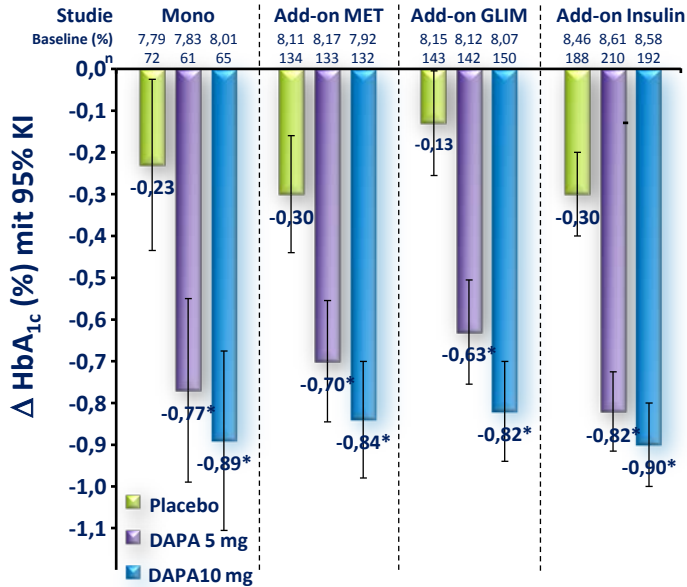


Substanzen:

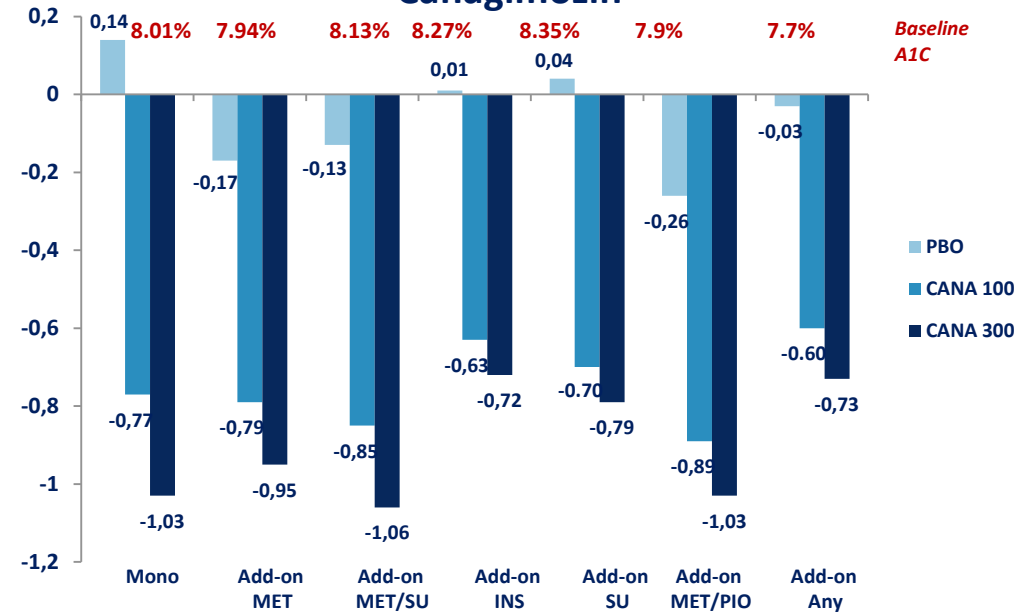
- Canagliflozin (Invokana[®])
- Dapagliflozin (Forxiga[®])
- Empagliflozin (Jardiance[®])

SGLT2-Hemmung: Glykämische Kontrolle

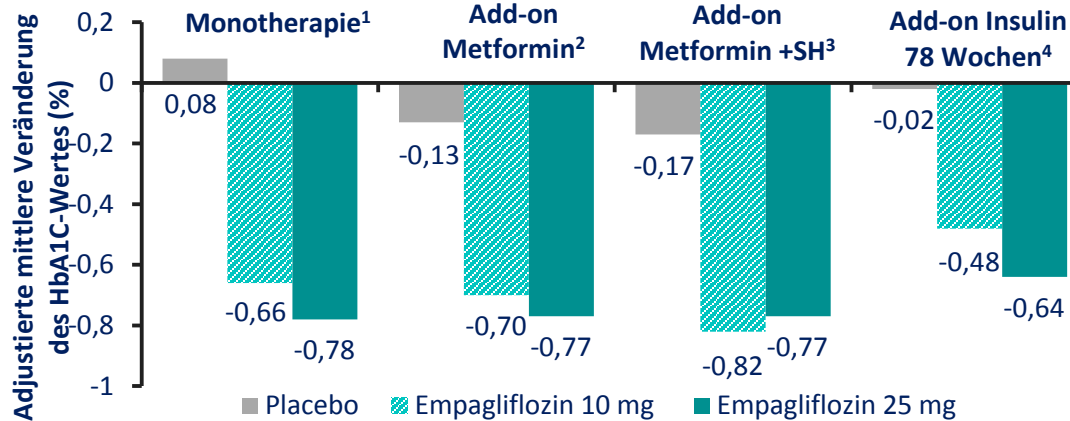
Dapagliflozin



Canagliflozin



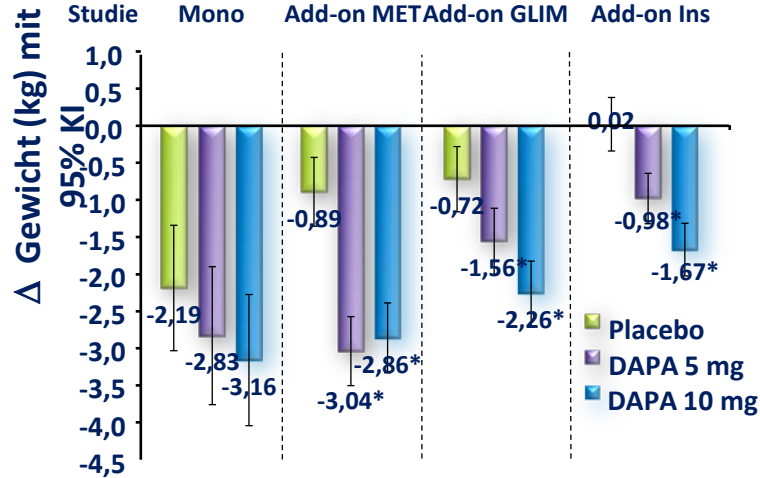
Empagliflozin



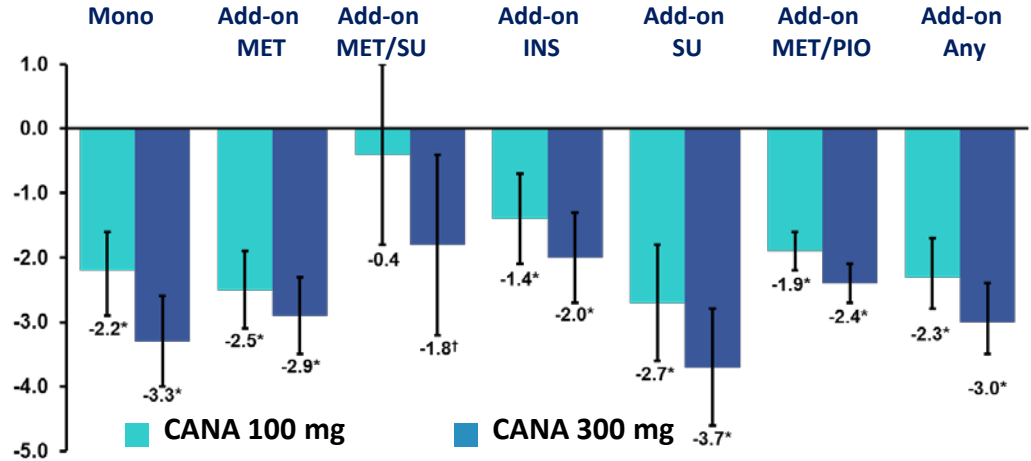
Parikh et al. 48th EASD Annual Meeting, Berlin, 1–5 October 2012, Poster #744. Stenlof et al. Diabetes Obes Metab. 2013 Apr;15(4):372-82. doi: 10.1111/dom.12054. Epub 2013 Jan,24, Matthews D. et al. Poster presented at the 48th European Association for the Study of Diabetes (EASD);2012;Oct.1-5: Berlin, Germany, (P764). Forst T et al. Poster presented at the 4th World Congress on Controversies to Consensus in Diabetes, Obesity and Hypertension (CODHy), 2012;Nov.8-11; Barcelona, Spain, (P64). Bode B. et al. Poster presented at the 48th European Association for the Study of Diabetes (EASD);2012;Oct.1-5: Berlin, Germany, (P765). 1. Roden M, et al. Lancet Diabetes Endocrinol. 2013;1(3):208–219. / 2. Häring HU et al. Diabetes Care. 2014; published online ahead of print. doi:10.2337/dc13-2105 / 3. Häring H-U, et al. Diabetes Care. 2013;36:3396–3404. / 4. Rosenstock J, et al. American Diabetes Association (ADA) 73rd Scientific Sessions, 21–25 June 2013, Chicago, IL, USA (Poster 1102-P).

SGLT2-Hemmung: Reduktion des Körpergewichtes

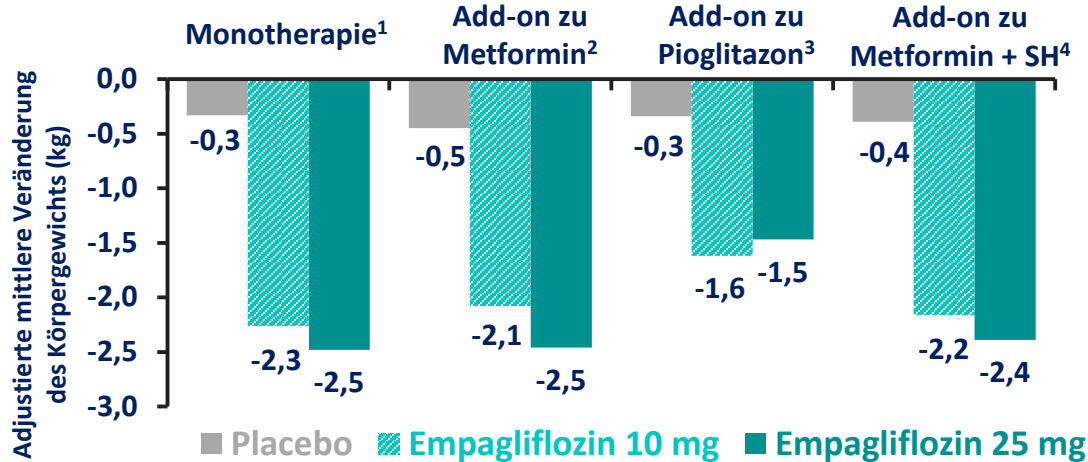
Dapagliflozin



Canagliflozin



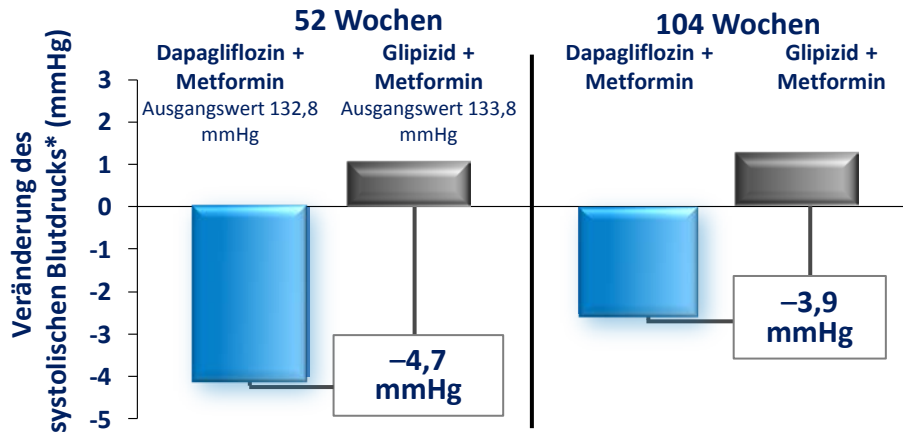
Empagliflozin



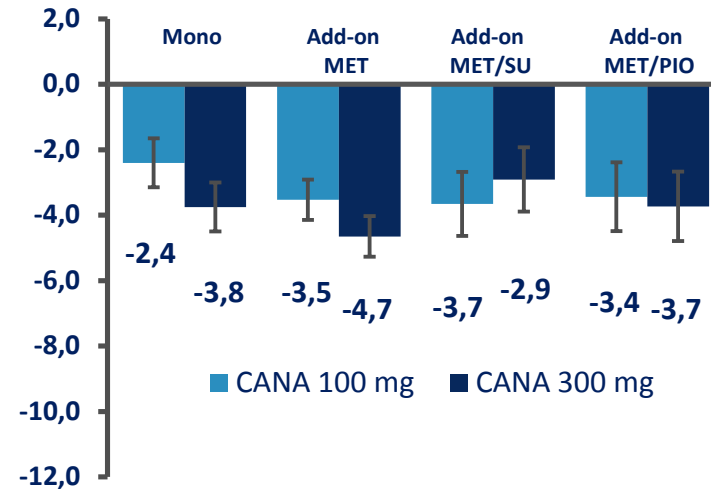
Parikh et al. 48th EASD Annual Meeting, Berlin, 1–5 October 2012, Poster #744. Stenlof et al. Diabetes Obes Metab. 2013 Apr;15(4):372–82. doi: 10.1111/dom.12054. Epub 2013 Jan,24, Matthews D. et al. Poster presented at the 48th European Association for the Study of Diabetes (EASD);2012;Oct.1-5: Berlin, Germany, (P764). Forst T et al. Poster presented at the 4th World Congress on Controversies to Consensus in Diabetes, Obesity and Hypertension (CODHy), 2012;Nov.8-11; Barcelona, Spain, (P64). Bode B. et al. Poster presented at the 48th European Association for the Study of Diabetes (EASD);2012;Oct.1-5: Berlin, Germany, (P765). 1. Roden M, et al. Lancet Diabetes Endocrinol. 2013;1(3):208–219. / 2. Häring HU et al. Diabetes Care. 2014; published online ahead of print. doi:10.2337/dc13-2105. / 3. Kovacs C, et al. Diabetes Obes Metab 2013; 16(2):147–158. / 4. Häring H-U, et al. Diabetes Care. 2013;36:3396–3404.

SGLT2-Hemmung: Reduktion des Blutdrucks

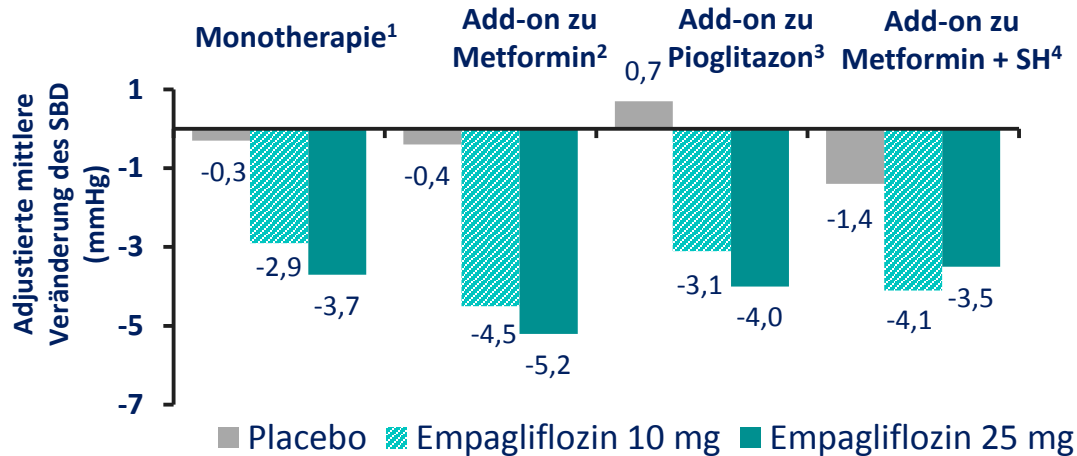
Dapagliflozin



Canagliflozin



Empagliflozin



Matthews D. et al. Poster presented at the 48th European Association for the Study of Diabetes (EASD);2012;Oct.1-5: Berlin, Germany, (P764). Forst T et al. Poster presented at the 4th World Congress on Controversies to Consensus in Diabetes, Obesity and Hypertension (CODHy), 2012;Nov.8-11; Barcelona, Spain, (P64). Bode B. et al. Poster presented at the 48th European Association for the Study of Diabetes (EASD);2012;Oct.1-5: Berlin, Germany, (P765). Wilding J et al. Poster presented at the 4th World Congress on Controversies to Consensus in Diabetes, Obesity and Hypertension (CODHy), 2012;Nov.8-11; Barcelona, Spain, (P73). 1. Roden M, et al. Lancet Diabetes Endocrinol. 2013;1(3):208–219. / 2. Häring HU et al. Diabetes Care. 2014; published online ahead of print. doi:10.2337/dc13-2105. / 3. Kovacs C, et al. Diabetes Obes Metab 2013; 16(2):147-158. / 4. Häring H-U, et al. Diabetes Care. 2013;36:3396–3404.

Kardiovaskuläre Endpunktstudien mit neuen Antidiabetika

Trial Name	Drug	Target Enrollment	Timing*
DPP-4 Inhibitors			
SAVOR	Saxagliptin	N=16,492	Began 2010; Complete
EXAMINE	Alogliptin	N=5384	Began 2009; Complete
TECOS	Sitagliptin	N=14,000	Began 2008; Complete
CAROLINA	Linagliptin	N=6000	Began 2010; Ending 2018
CARMELINA	Linagliptin	N=8300	Began 2013; Ending 2018
GLP-1 Agonists			
ELIXA	Lixisenatide	N=6000	Began 2010; Complete
EXSCEL	Exenatide	N=9500	Began 2010; Ending 2017
LEADER	Liraglutide	N=9340	Began 2010; Complete
REWIND	Dulaglutide	N=9622	Began 2011; Ending 2019
SUSTAIN 6	Semaglutide	N=3260	Began 2013; Complete
SGLT-2 Inhibitors			
CANVAS	Canagliflozin	N=4410	Began 2009; Ending 2017
Empa-Reg Outcome	Empagliflozin	N=7000	Began 2010; Complete
DECLARE	Dapagliflozin	N=17,150	Began 2013; Ending 2019

EMPA-REG OUTCOME[®]: Zusammenfassung

- Empagliflozin reduzierte das relative Risiko für kardiovaskulären Tod, nicht-tödlichem Myokardinfarkt oder nicht-tödlichem Schlaganfall um **14%**
- Empagliflozin reduzierte kardiovaskuläre Mortalität um **38%**
- Empagliflozin reduzierte die Gesamtmortalität um **32%**
- Empagliflozin reduzierte die Hospitalisierung wegen Herzinsuffizienz um **35%**

SGLT2-Inhibitoren bei kardiovaskulärem Syndrom

- Empagliflozin (Jardiance®), Dapagliflozin (Forxiga®), (Canagliflozin, Invokana®)
- Reduktion von HbA1c, Körpergewicht und Blutdruck
- Kein Hypoglykämierisiko
- Empagliflozin (EMPA-REG OUTCOME) reduziert bei Patienten mit T2DM und hohem kardiovaskulären Risiko
 - Kardiovaskuläre Endpunkte
 - Mortalität
 - Krankenhausaufenthalte wegen Herzinsuffizienz
 - Renale Endpunkte
- Glukose senkende Wirkung reduziert, aber kardioprotektive und nephroprotektive Wirkung erhalten bei Niereninsuffizienz



Kardioprotektion, Nephroprotektion