

Supplementary Material:

Supplementary Table 1 Detailed search strategy

Database	Search terms
Scopus (n = 1198)	(sodium bicarbonate) AND (metabolic acidosis) AND (CKD OR "chronic kidney disease")
PubMed (n = 936)	("sodium bicarbonate"[MeSH Terms] OR ("sodium"[All Fields] AND "bicarbonate"[All Fields]) OR "sodium bicarbonate"[All Fields]) AND ("acidosis"[MeSH Terms] OR "acidosis"[All Fields] OR ("metabolic"[All Fields] AND "acidosis"[All Fields]) OR "metabolic acidosis"[All Fields]) AND ("renal insufficiency, chronic"[MeSH Terms] OR ("renal"[All Fields] AND "insufficiency"[All Fields] AND "chronic"[All Fields]) OR "chronic renal insufficiency"[All Fields] OR ("chronic"[All Fields] AND "kidney"[All Fields] AND "disease"[All Fields]) OR "chronic kidney disease"[All Fields] OR "CKD"[All Fields])
Cochrane Library (n = 31)	(sodium bicarbonate) AND (metabolic acidosis) AND (CKD OR chronic kidney disease)
Embase (n = 200)	(sodium bicarbonate) AND (metabolic acidosis) AND (CKD OR chronic kidney disease)

Supplementary Table 2 Meta regression values for change in eGFR

Baseline Characteristics for change in eGFR	Coefficient	<i>P</i> value
Male (%)	-0.1006	0.0121
Age (years)	-0.1337	0.0417
Serum bicarbonate (mean, mmol/L)	0.0379	0.2837

Supplementary Table 3: Meta regression values for change in serum bicarbonate.

Baseline Characteristics for change in serum bicarbonate	Coefficient	<i>P</i> value
Male (%)	-0.1501	0.0063

Age (years)	-0.0552	0.2761
Serum bicarbonate (mean, mmol/L)	-0.2468	0.3313

Supplementary Table 4: Meta regression values for death/prolonged hospitalization.

Baseline Characteristics for death/prolonged hospitalization	Coefficient	P value
Male (%)	-0.0308	0.4425
Age (years)	-0.0093	0.8549
Serum bicarbonate (mean, mmol/L)	-0.0724	0.5733

Supplementary Figure 1. Risk of bias in RCTs.

Study ID	Randomisation domain					Overall
	D1	D2	D3	D4	D5	
Mathur et al (2006)	+	+	+	+	+	+
Ashurst et al (2009)	+	+	+	+	+	+
Goraya et al (2013)	+	+	+	+	+	+
Goraya et al (2014)	+	+	+	+	+	+
Bellasi et al (2016)	+	+	+	+	+	+
Yan et al (2017)	+	-	+	-	+	-
Kendrick et al (2018)	+	!	+	-	+	-
Iorio et al (2019)	-	+	+	+	+	-
Goraya et al (2019)	+	+	+	+	+	+
Aigner et al (2019)	!	+	+	+	+	!
Raphael et al (2020)	+	+	+	+	+	+
Kittikulnam et al (2020)	+	+	+	+	+	+
Melamed et al (2020)	+	+	+	+	+	+
BiCARB study group (2020)	+	+	+	+	+	+
Witham et al (2020)	+	+	+	!	+	!
Alva et al (2020)	!	+	+	-	!	-
Dubey et al (2020)	+	+	+	+	+	+
Bovée et al (2021)	+	+	+	+	+	+
Mohebbi et al (2023)	+	+	+	+	+	+
Sorohan et al (2024)	-	+	+	-	+	-

+ Low risk
! Some concerns
- High risk

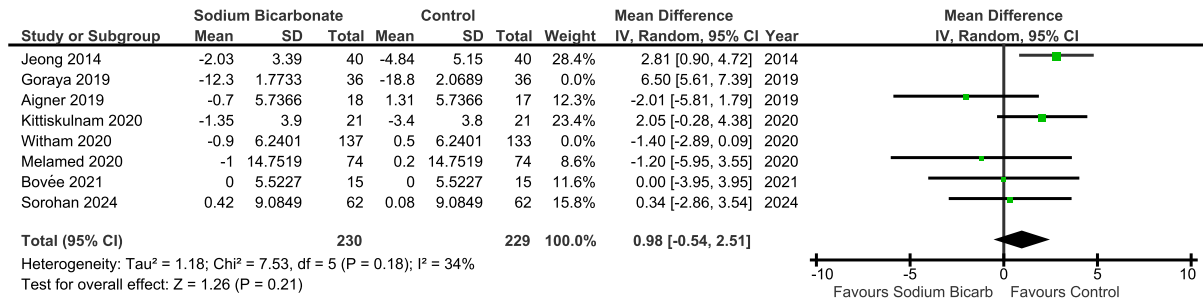
D1 Randomisation process
D2 Deviations from the intended interver
D3 Missing outcome data
D4 Measurement of the outcome
D5 Selection of the reported result

Supplementary Figure 2. Risk of bias in non-randomized clinical trials

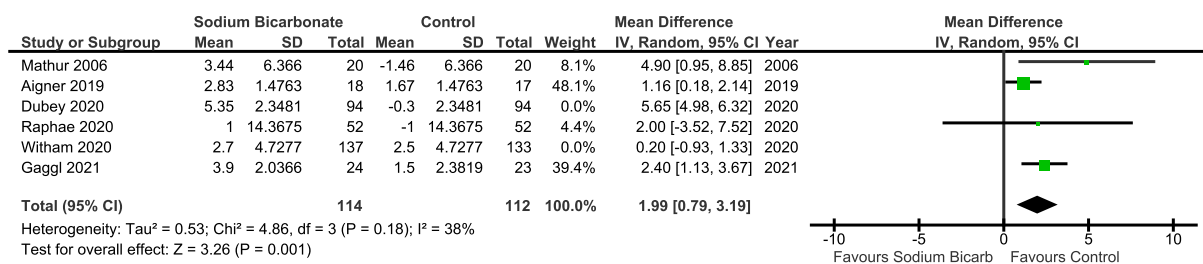
Study ID	Risk of bias domains							Overall
	D1	D2	D3	D4	D5	D6	D7	
Abramowitz et al 2013	+	+	+	+	+	+	+	+
Jeong et al 2014	!	+	+	+	+	+	+	!

- + Low risk
 - ! Some concerns
 - High risk
- D1 Bias due to confounding
 - D2 Bias due to selection of participants
 - D3 Bias in classification of interventions
 - D4 Bias due to deviation from intended intervent
 - D5 Bias due to missing data
 - D6 Bias in measurement of outcomes
 - D7 Bias in selection of reports results

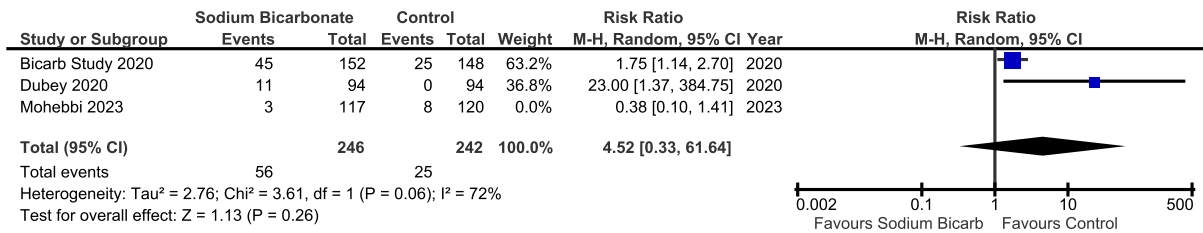
Supplementary Figure 3. Sensitivity analysis forest plot of change in eGFR.



Supplementary Figure 4. Sensitivity analysis forest plot of change in sodium bicarbonate.

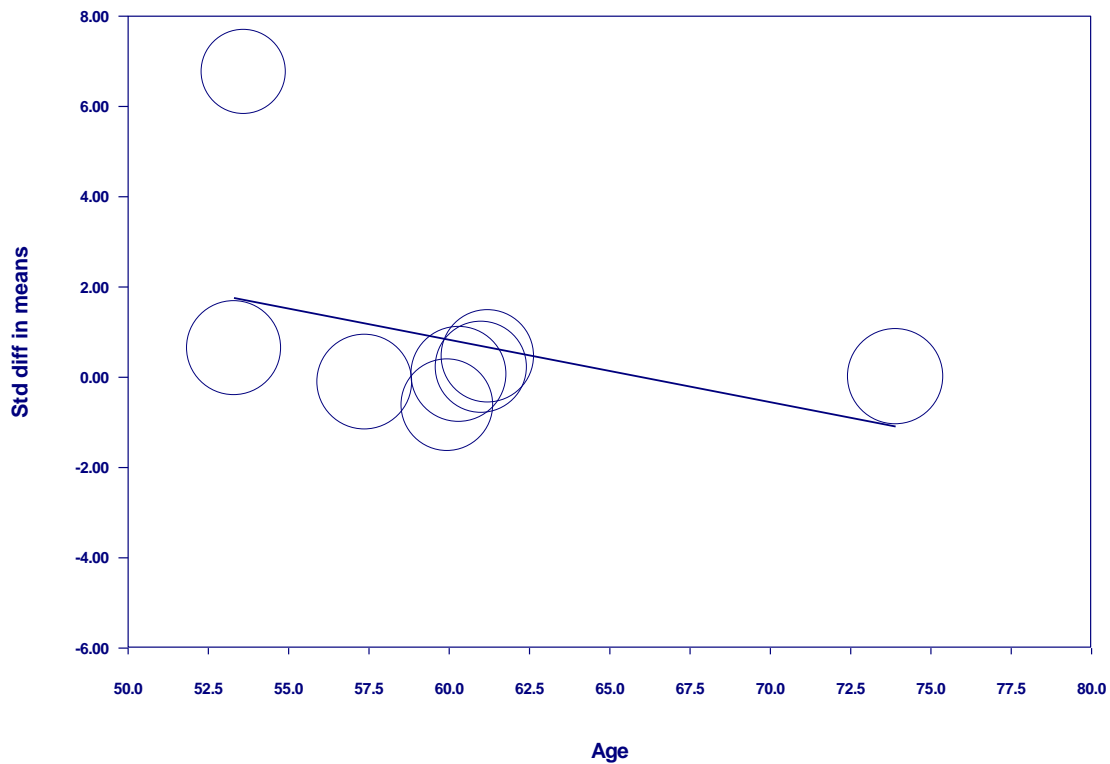


Supplementary Figure 5. Sensitivity analysis forest plot of GI disorders.

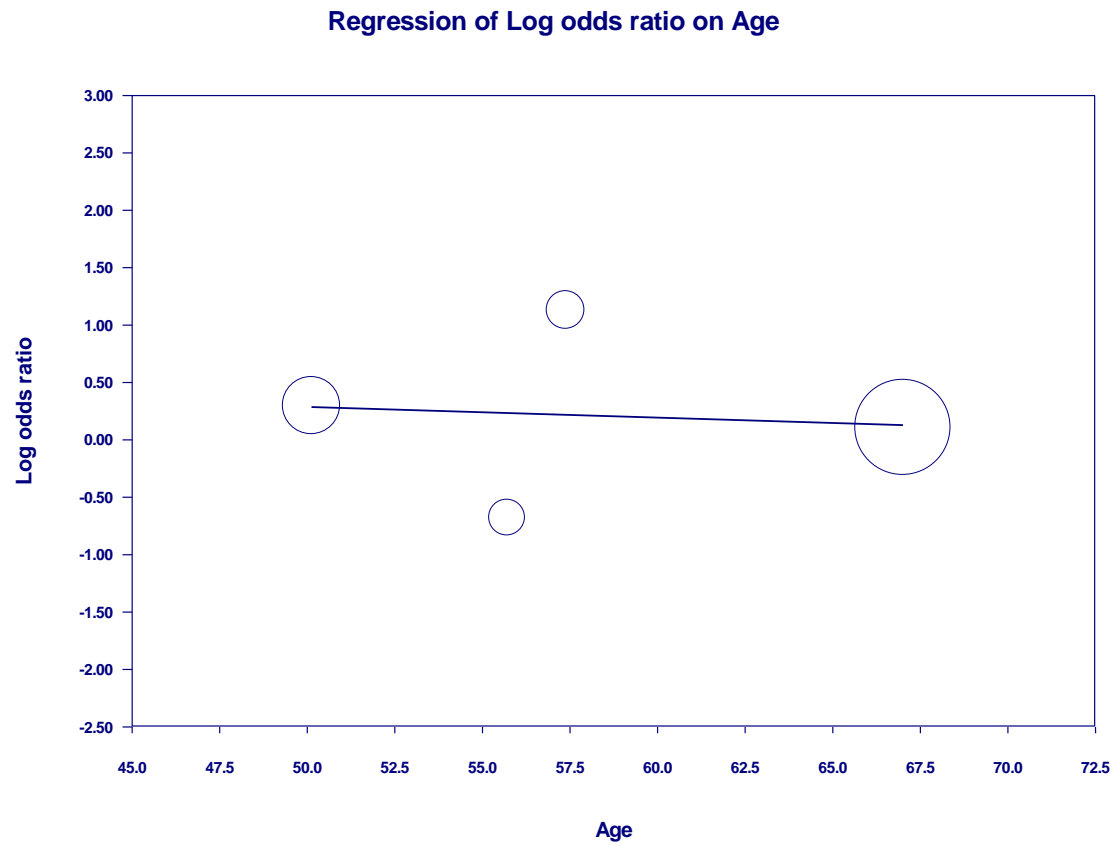


Supplementary Figure 6 Meta-regression on age (years) for change in eGFR

Regression of Std diff in means on Age



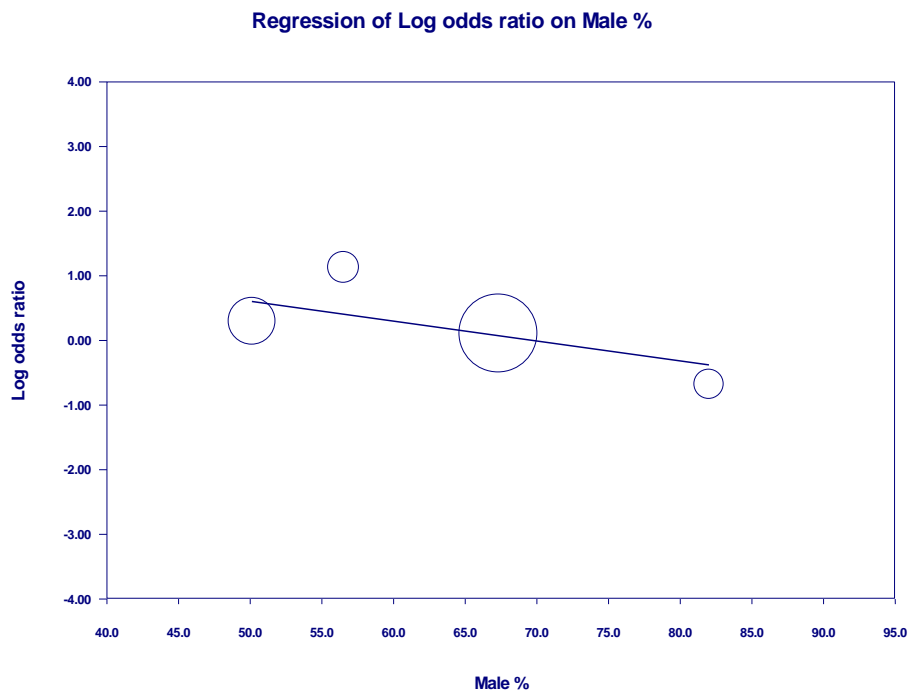
Supplementary figure 7: Meta-regression on age (years) for death/prolonged hospitalization



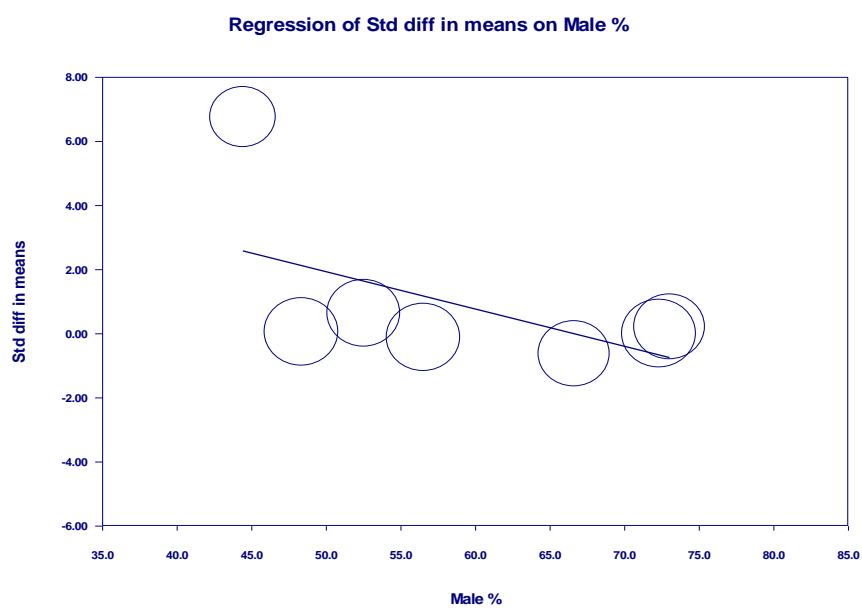
Supplementary figure 8: Meta-regression on age (years) for change in serum bicarbonate



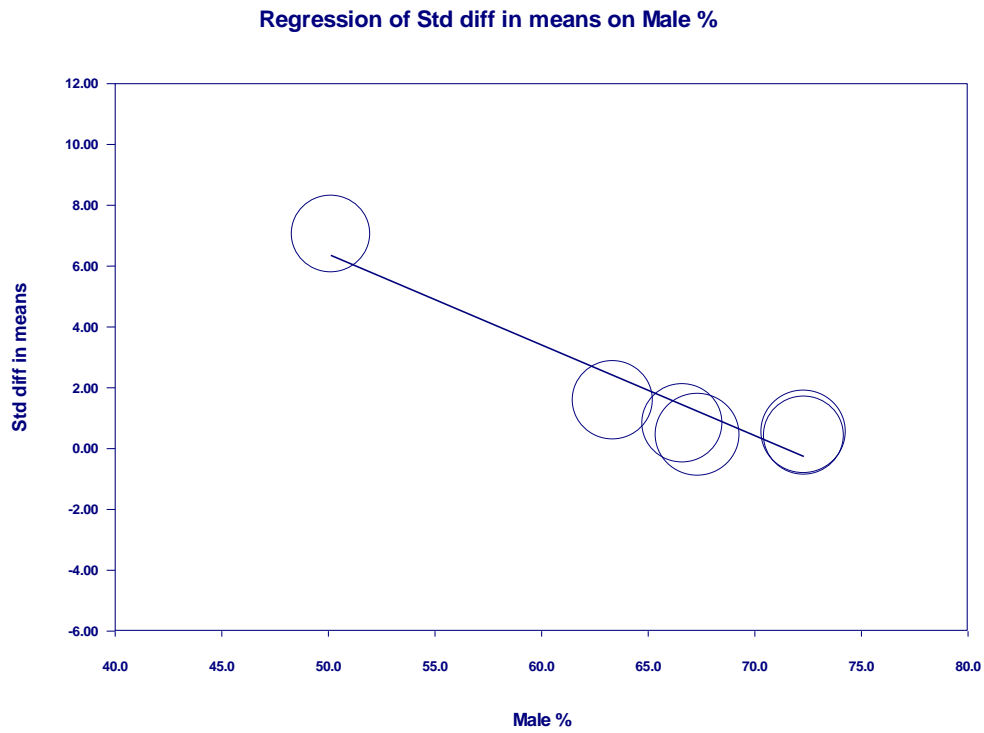
Supplementary figure 9: Meta-regression on male (%) for death/prolonged hospitalization



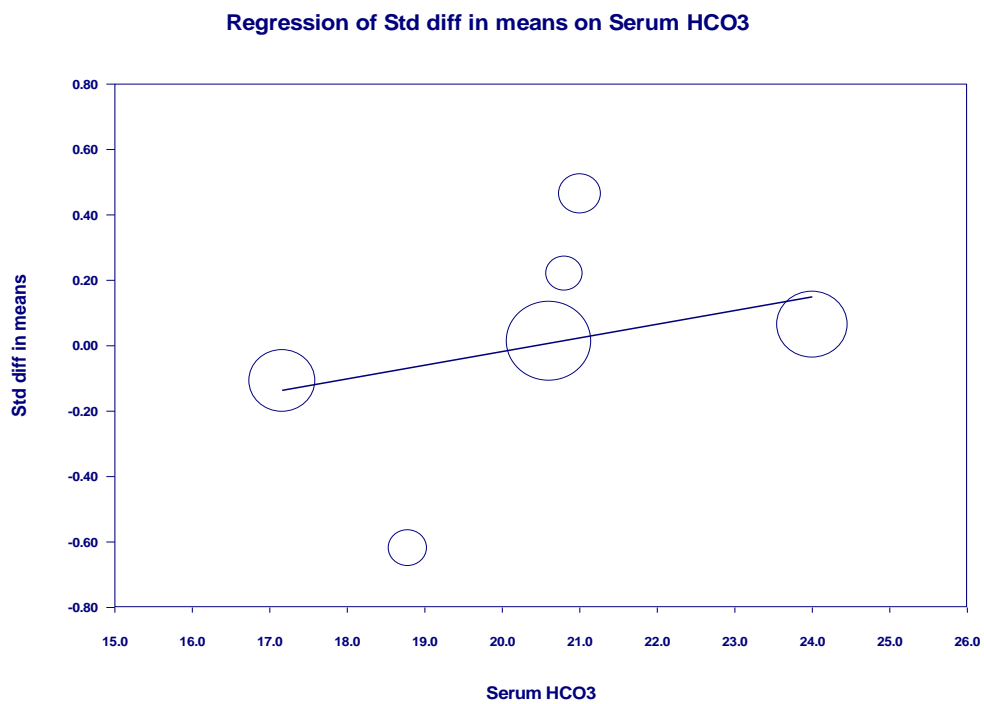
Supplementary figure 10. Meta-regression on male (%) for change in eGFR



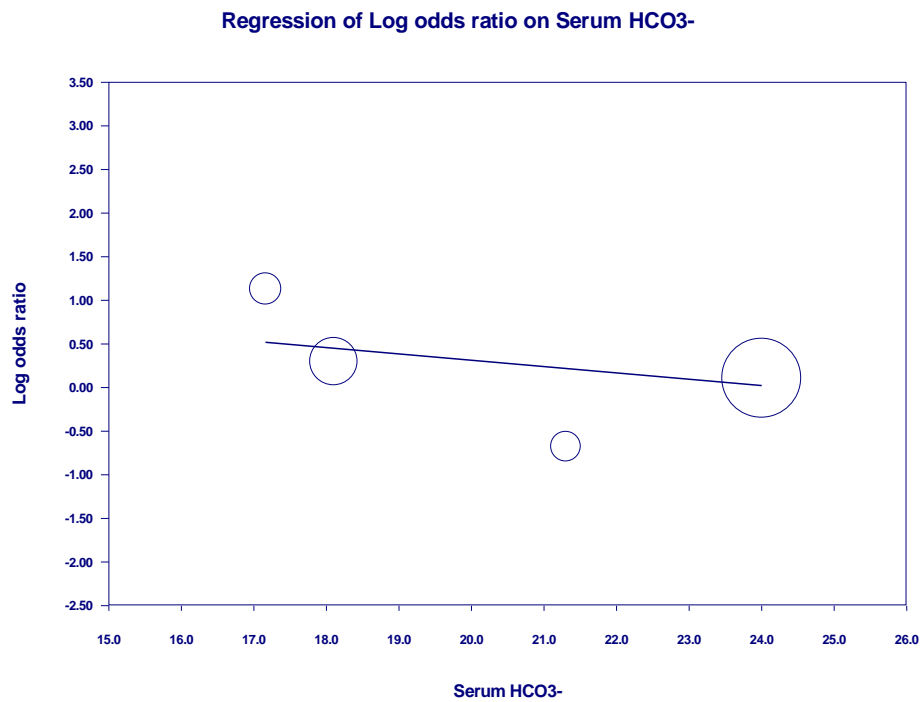
Supplementary figure 11: Meta-regression on male (%) for change in serum bicarbonate



Supplementary figure 12. Meta-regression on serum bicarbonate (mean, mmol/L) for change in eGFR



Supplementary figure 13: Meta-regression on serum bicarbonate (mean, mmol/L) for death/prolonged hospitalization



Supplementary figure 14: Meta-regression on serum bicarbonate (mean, mmol/L) for change in serum bicarbonate

