**Evidence Table E-15. Summary of studies comparing N-acetylcysteine plus IV normal saline versus IV sodium bicarbonate for the prevention of contrast-induced nephropathy and other outcomes**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Author, year** | **Comparison** | **N randomized (N analyzed)** | **Population** | **Age (years) or range of means** § | **Number. female (%)**‡ | **Total followup** | **CM route** | **Primary definition of CIN\*** | **Study limitations†** |
| Castini, 2010[28](#_ENREF_28) | IV normal salineOral NAC +IV normal saline IV NaHCO3 in 5% dextrose in water without NAC | 156 (156) | Baseline SrCr 1.2 to 4 mg/dl. | 70-73 | 19 (12) | 5 days (labs were drawn at 24 hours, 48 hours, and at 5 days after the procedure) | IOCM (Iodixanol)IA | A1(secondary endpoint: A2) | M |
| Heguilen, 2013[45](#_ENREF_45) | IV NaHCO3 in 5% dextrose in water NAC + normal saline in 5% dextrose in water without NAC | 133 (123) | Stable SrCr 1.25 mg/dl (110 micromol/l) to 4.5 mg/dl (364.5 micromol/l), or Cockcroft-Gault-estimated creatinine clearance < 45 ml/min | 65-69 | 34 (28) | 2-3 days | LOCM (Ioversol)IA | A1 | M |
| Kama, 2014[54](#_ENREF_54) | IV Normal Saline vs IV NAC in Normal Saline vs IV NaHCO3 in Normal Saline | 107 (107) | High risk of CIN, using Mehran score (>5 points) | 71 | 48 (45) | 1 month | LOCM (Iohexol)Route NR | A3 | M |
| Ozcan, 2007[87](#_ENREF_87) | Oral NAC + IV normal saline IV NaHCO3 in 5% dextrose in water without NAC | 264 (NR) | Baseline SrCr >1.2 to 4 mg/dl | 67-70  | 67 (25) |  48 hours | LOCM (Ioxaglate)IA | A3 | H |
| Ratcliffe, 2009 [93](#_ENREF_93) | IV and oral NAC + IV normal saline in 5% dextroseIV NaHCO3 in 5% dextrose without NAC | 118 (78) | Renal insufficiency and/or diabetes mellitus(renal insufficiency defined asSrCr > 132.6 µmol/L (1.5 mg/dl) in men, and > 114.9 µmol/L(1.3 mg/dl) in women) or reduced calculated creatinine clearance (< 1.002 mL/s) using Cockcroft-Gault formula) | 66 | 31 (40) | 7 days (labs were drawn at 24, 72, and 168 hours after the procedure) | IOCM (Iodixanol)IA | A1\* | H |

**Evidence Table E-15. Summary of studies comparing N-acetylcysteine plus IV normal saline versus IV sodium bicarbonate for the prevention of contrast-induced nephropathy and other outcomes (continued)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Author, year** | **Comparison** | **N randomized (N analyzed)** | **Population** | **Age (years) or range of means** § | **Number. female (%)**‡ | **Total followup** | **CM route** | **Primary definition of CIN\*** | **Study limitations†** |
| Shavit, 2009[101](#_ENREF_101)(prospective, partially blinded trial) | IV NaHCO3 in 5% dextrose in water oral NAC + intravenous normal saline  | 93 (87) | CKD stage III–IV (estimated glomerular filtration rate 15-60 mL/min calculated by the MDRD formula)  | 71-72 | 19 (22) | 48 hours | LOCM (Iopamidol)IA | A1 (authors also used a definition of SrCr increase of > 0.3 mg/dL) | H |
| Thayssen, 2014[107](#_ENREF_107) | IV Normal Saline vsIV Normal Saline + oral NAC vsIV Normal Saline + IV NaHCO3 vsIV Normal Saline + oral NAC + IV NaHCO3 | 715 | STEMI | 63 | 165 (23.1) | 30 Days | IOCM (Iodixanol)IA | A3 | M |
| Yeganehkhah, 2014[117](#_ENREF_117) |  IV Normal Saline + IV NaHCO3 vs Oral NAC + IV Normal Saline | 100 | High risk of CIN | 59.2 | 72 (48) | 48hrs | LOCM (Iohexol)IA | A1 | H |

%=percent; CIN=contrast induced nephropathy; CKD=chronic kidney disease; CM=contrast media; IA=intrarterial; IOCM=iso-osmolar contrast media; IV-intravenous; LOCM=low-osmolar contrast media; MDRD= Modification of Diet in Renal Diseases; Mg/dl=milligram per deciliter; Micromole/l=micromole per liter; Ml/min=milliliter per minute; Ml/s=milliliter per second; N=sample size; NAC=N-acetylcysteine; NaHCO3=sodium bicarbonate; NR=not reported; SrCr=serum creatinine; STEMI= ST Elevation Myocardial Infarction; Umol/l=micromole/liter

\* CIN definitions: rise in serum creatinine relative to baseline: ≥25% (A1);> 25% (A1\*); ≥0.5 mg/dl (A2); ->25% or 0.5 mg/dl (A3); ≥50% (A4), B: >25% reduction in creatinine clearance

† Study limitations: L=low risk of bias; M=moderate risk of bias; H=high risk of bias

‡ Percent females in entire study population

§ Some studies only reported mean age per arm, not one mean for whole population. This column shows range of the means across all arms if the mean age for the whole population is not reported.

\*n/N refers to number of events divided by number at risk.