
This paper was published on-line in Heart on 21 August 2012. It reports a meta-analysis of six earlier papers. 1–6 It has come to our attention that two of these papers contain duplicate data in tables reporting baseline data and treatment effects. 3 4 The matter was considered by BMJ Publishing Ethics Committee. The Committee considered that without sight of the raw data on which the two papers containing the duplicate data were based, their reliability could not be substantiated. Following inquiries, it turns out that the raw data are no longer available having been lost as a result of computer failure. Under the circumstances, it was the Committee’s recommendation that the Heart meta-analysis should be retracted on the ground that the reliability of the data on which it is based cannot be substantiated.

Heart 2013;99:820.
doi:10.1136/heartjnl-2012-302337
Appendix 1

Not English language

No morbidity/mortality outcomes


6.) Roberts HJ. Use of a low-sodium formula as an improved Karell diet, with emphasis upon the outpatient management of heart failure and lymphedema. Am Heart J. 1963; 65:32-49

Animal

No active comparator


10.) RJ, Mudge GH, Nurnberg MJ. Congestive Heart Failure: Variations in Electrolyte Metabolism with Salt Restriction and Mercurial Diuretics. Circ.1951;4:54-69.


17.) Hummel SL, Seymour EM, Sheth SS, Rosenblum HR, Brook RD, Wells JM, Weder AB. Effects of the Sodium-Restricted DASH Diet in Hypertensive Heart Failure with Preserved Ejection Fraction. J Cardiac Fail. 2011;17: S3-S4


34.) Cadnapaphornchai MA, Gurevich AK, Weinbergera HD, Schriera RW. Pathophysiology of Sodium and Water Retention in Heart Failure. Cardiol. 2001;96:122–131


Not long enough follow up/not enough patients


Appendix 2

**Pubmed**


**Google Scholar**

heart failure OR cardiomyopathy sodium OR salt OR NaCl

**Embase**

(cardiomyopathy OR heart failure OR systolic dysfunction OR left ventricular dysfunction) AND (NaCl OR sodium chloride OR sodium restriction OR salt intake)

Limited to (English language and (clinical trial or randomized controlled trial or controlled clinical trial or multicenter study or phase 1 clinical trial or phase 2 clinical trial or phase 3 clinical trial or phase 4 clinical trial))

**Scopus**

TITLE-ABS-KEY(("heart failure" OR cardiomyopathy OR "systolic dysfunction" OR cardiomyopathies OR chf) AND (salt OR sodium OR nacl OR "Na Cl")) AND SUBJAREA(mult OR agri OR bioc OR immu OR neur OR phar OR mult OR medi OR nurs OR vete OR dent OR heal) AND (EXCLUDE(DOCTYPE, "re") OR EXCLUDE(DOCTYPE, "ed") OR EXCLUDE(DOCTYPE, "bk")) AND (EXCLUDE(SUBJAREA, "VETE") OR EXCLUDE(SUBJAREA, "MATH") OR EXCLUDE(SUBJAREA, "CENG") OR EXCLUDE(SUBJAREA, "ENGI") OR EXCLUDE(SUBJAREA, "COMP") OR EXCLUDE(SUBJAREA, "BUSI") OR EXCLUDE(SUBJAREA, "MATE") OR EXCLUDE(SUBJAREA, "PHYS") OR EXCLUDE(SUBJAREA, "ENER") OR EXCLUDE(SUBJAREA, "DENT") OR EXCLUDE(SUBJAREA, "ARTS") ) AND (EXCLUDE(EXACTKEYWORD, "Animals") OR EXCLUDE(EXACTKEYWORD, "Animal experiment") OR EXCLUDE(EXACTKEYWORD, "Animal model") OR EXCLUDE(EXACTKEYWORD, "Rat") OR EXCLUDE(EXACTKEYWORD, "Rats") OR EXCLUDE(EXACTKEYWORD, "Animal") AND (EXCLUDE(EXACTKEYWORD, "Case report") OR EXCLUDE(EXACTKEYWORD, "Case Report") ) AND (LIMIT-TO(LANGUAGE, "English"))

**Cochrane**

(salt OR sodium OR NaCl OR Na OR Na):and (heart failure OR cardiomyopathy OR left ventricular failure OR cardiomegaly OR ejection fraction OR EF OR LVEF OR systolic failure OR HF OR CHF

**Combined EMBASE/MEDLINE**

1. exp heart failure/
2. exp cardiomyopathy/
3. exp sodium chloride/
4. exp sodium restriction/
5. exp salt intake/
6. exp sodium intake/
7. exp sodium intake/
8. exp sodium/
9. exp dietary sodium/
10. exp dietary salt/
11. exp salt intake/
12. exp sodium intake/
13. exp sodium, dietary/
14. exp salt-tolerance/
15. exp sodium chloride, dietary/
16. exp heart ventricle function/
17. 1 or 2 or 16
18. 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15
19. 17 and 18
20. limit 19 to english language
21. remove duplicates from 20
22. limit 21 to "review"
23. 21 not 22
24. limit 23 to animal studies
25. limit 24 to animals
26. from 24 keep 1-564
27. from 25 keep 502-1004
28. 26 or 27
29. limit 28 to animal studies
30. limit 29 to animals
31. from 30 keep 1-501
32. 26 not 31
33. 26 or 27 or 32
34. limit 33 to human
35. limit 34 to humans
36. limit 35 to humans
37. 34 or 35 or 36
38. 33 not 37
39. 23 not 38
40. limit 39 to (embryo or infant or child or preschool child <1 to 6 years> or school child <7 to 12 years> or adolescent <13 to 17 years>)
41. limit 40 to (adult <18 to 64 years> or aged <65+ years>)
42. from 40 keep 1-89
43. from 41 keep 1-29
44. 42 not 43
45. 39 not 44
46. from 40 keep 90-730
47. limit 46 to ("all infant (birth to 23 months)" or "all child (0 to 18 years)" or "newborn infant (birth to 1 month)" or "infant (1 to 23 months)" or "preschool child (2 to 5 years)" or "child (6 to 12 years)" or "adolescent (13 to 18 years)")
48. limit 47 to ("all adult (19 plus years)" or "young adult (19 to 24 years)" or "adult (19 to 44 years)" or "young adult and adult (19-24 and 19-44)" or "middle age (45 to 64 years)" or "middle aged (45 plus years)" or "all aged (65 and over)" or "aged (80 and over)")
49. 47 not 48
50. from 45 keep 1970-2610
51. 50 not 49
52. from 45 keep 1-1969
53. 51 or 52
54. limit 53 to (clinical trial or randomized controlled trial or controlled clinical trial or multicare study or phase 1 clinical trial or phase 2 clinical trial or phase 3 clinical trial or phase 4 clinical trial)
55. from 54 keep 1-376
56. from 53 keep 1970-2585
57. 55 or 56
58. limit 57 to editorial
59. 57 not 58

Web of Science
Topic=(("heart failure" OR cardiomyopathy OR cardiopathy OR cardiomyopathies OR cardiopathies OR "systolic dysfunction") AND (salt OR sodium OR NaCl))
Refined by: Languages=( ENGLISH OR UNSPECIFIED ) AND Document Type=( ARTICLE OR MEETING ABSTRACT OR LETTER OR DISCUSSION OR PROCEEDINGS PAPER OR NOTE OR CORRECTION OR REPRINT )
Databases=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All Years
Lemmatization=On
Supplemental Table 1

Characteristics of each trial

<table>
<thead>
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<tbody>
<tr>
<td><strong>Patients</strong></td>
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<tr>
<td>(n)</td>
<td>54 vs. 53</td>
<td>46 vs. 48</td>
<td>114 vs. 118</td>
<td>86 vs. 87</td>
<td>179 vs. 191</td>
<td>890 vs. 881</td>
</tr>
<tr>
<td><strong>Inclusion criteria</strong></td>
<td>Refractory CHF (NYHA class IV), EF &lt; 25%, creatinine &lt; 2 mg/dl, BUN &lt; 60 mg/dl, urinary volume and low nitrogen (BUN ≤ 60 mg/dl, reduced Urinary volume and low natriuresis (&lt; 500 ml/24 h and &lt; 60 mEq/24h, respectively)</td>
<td>Uncompensated (NYHA class II), EF &lt; 35%, creatinine &lt; 2 mg/dl, urinary output of 2,500 ml/day</td>
<td>Compensated (NYHA class II) hospitalized within previous 30 days for recently decompenstate (Class IV) CHF, EF &lt; 35%, creatinine &lt; 2 mg/dl, urinary volume (&lt; 500 ml/24 hours) and low urinary output of 2,500 ml/day</td>
<td>Recently hospitalized but in a compensated state (NYHA class II), EF &lt; 35%, creatinine &lt; 2 mg/dl</td>
<td>Compensated HF (NYHA class II-IV), EF &lt; 35% and creatinine &lt; 2 mg/dl</td>
<td>Hospitalized uncompensated (NYHA class III) subsequently discharged (NYHA class II), EF &lt; 40%, creatinine &lt; 2.5 mg/dl, BUN &lt; 60 mg/dl and reduced urinary volume (&lt; 800 ml/day)</td>
</tr>
<tr>
<td>Protocol</td>
<td>Group 1: 2.8 g/day Na plus IV furosemide (500 mg - 1000 mg) BID plus HSS.</td>
<td>Group 1: 2.8 g/day Na, IV furosemide (500-1000 mg) PO BID plus HSS.</td>
<td>Group 2: 1.8 g/day Na, same furosemide.</td>
<td>Group 1: 2.8 g/day Na plus oral furosemide (125 mg-250 mg) BID, 2/3rds of patients received 125 mg BID.</td>
<td>8 groups placed on 1.8 g/day or 2.8 g/day of Na with HSS(stopped once). 50-125 mg furosemide</td>
<td>1.8 g/day fluid restriction.</td>
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<tr>
<td></td>
<td>2.8 g/day Na, IV furosemide (500-1000 mg) BID plus HSS.</td>
<td>1.8 g/day Na, same furosemide.</td>
<td>2/3rds of patients received 125 mg BID.</td>
<td>ACE-Is (100%), spironolactone 25 mg</td>
<td>All patients received 50 mg BID. Patients were also on ACE-Is (100%), spironolactone e (85%) and carvedilol (70%). Both groups received 1 L fluid restriction.</td>
<td>1.8 g/day fluid restriction.</td>
</tr>
<tr>
<td></td>
<td>1.8 g/day Na, same furosemide, without HSS.</td>
<td>ACE-Is (87%) and carvedilol 6.25-25 mg BID (8%).</td>
<td>ACE-Is (100%), spironolactone 25 mg</td>
<td>All patients received 1 L fluid restriction.</td>
<td>Both groups received 1 L fluid restriction.</td>
<td>1.8 g/day fluid restriction.</td>
</tr>
<tr>
<td></td>
<td>All patients were on ACE-Is and spironolactone 25 mg</td>
<td>Both groups received 1 L fluid</td>
<td>Both groups received 1 L fluid</td>
<td>Both groups received 1 L fluid restriction.</td>
<td>Both groups received 1 L fluid restriction.</td>
<td>1.8 g/day fluid restriction.</td>
</tr>
<tr>
<td></td>
<td>ACE-Is (100%).</td>
<td>(75%) and carvedilol</td>
<td>(75%) and carvedilol (55%).</td>
<td>Both groups received 1 L fluid restriction.</td>
<td>Both groups received 1 L fluid restriction.</td>
<td>1.8 g/day fluid restriction.</td>
</tr>
<tr>
<td></td>
<td>spironolactone 25 mg and carvedilol.</td>
<td>(100%) and carvedilol (93%)</td>
<td>and carvedilol (70%). Both groups</td>
<td>Both groups received 1 L fluid restriction.</td>
<td>Both groups received 1 L fluid restriction.</td>
<td>1.8 g/day fluid restriction.</td>
</tr>
<tr>
<td></td>
<td>was added to treatment in 1999.</td>
<td>Both groups</td>
<td>received 1 L fluid restriction.</td>
<td>Both groups received 1 L fluid restriction.</td>
<td>Both groups received 1 L fluid restriction.</td>
<td>1.8 g/day fluid restriction.</td>
</tr>
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<td>Both groups received 1 L fluid restriction.</td>
<td>Both groups</td>
<td>Both groups received 1 L fluid</td>
<td>Both groups received 1 L fluid restriction.</td>
<td>Both groups received 1 L fluid restriction.</td>
<td>1.8 g/day fluid restriction.</td>
</tr>
<tr>
<td>Start and End</td>
<td>Starting Serum Sodium</td>
<td>1L Fluid Restriction</td>
<td>Ending Serum Sodium</td>
<td>2L Fluid Restriction</td>
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<tr>
<td>vs. 140 at discharge</td>
<td>134.8 → 142.3</td>
<td>130.1 at discharge vs. 138.7 → 139.5</td>
<td>140 → 140 at discharge vs. 138.8 → 139.5</td>
<td>140 → 134.5 vs. 137.8</td>
<td></td>
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<tr>
<td>Follow-up</td>
<td>31 months (2.6 years)</td>
<td>30 days</td>
<td>180 days</td>
<td>12 months</td>
<td>180 days</td>
<td>57 months (4.75 years)</td>
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<tr>
<td>Starting and Ending Blood Pressure</td>
<td>134/77 → 114/72 vs. 145/80 → ND</td>
<td>107/77 vs. 125/83</td>
<td>126/82 → 107/77 vs. 111/75</td>
<td>250 mg then 2L furosemide groups: 1L vs. then 2L</td>
<td>114/71 → 112/77, 112/72 → 107/80, 115/69 → 111/83, 115/68</td>
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<td>vs. 137/75 → 115/68</td>
<td></td>
<td>vs. 125/83</td>
<td>vs. 138.7 → 139.5</td>
<td></td>
<td>vs. 137/75 → 112/65</td>
</tr>
<tr>
<td>HF etiology (%) or n</td>
<td>CAD (62.9% vs. 61.9%)</td>
<td>CAD (48% vs. 50%)</td>
<td>CAD (53 vs. 57)</td>
<td>CAD (43 vs. 41)</td>
<td>250 mg then 125 mg furosemide groups: DM (26.9%, 25.4% vs. 30.7%, 28%) CAD (53.8%, 50.9% vs. 59.6%, 52%) HHD (42.3%, 47% vs. 38.4%)</td>
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<td>HHD (32.4% vs. 33.6%)</td>
<td>HHD (28% vs. 29%)</td>
<td>HHD (37 vs. 39)</td>
<td>HHD (28 vs. 29)</td>
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<td>DCM (4.6% vs. 4.4%)</td>
<td>DCM (24% vs. 21%)</td>
<td>DCM (24 vs. 22)</td>
<td>DCM (16 vs. 16)</td>
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<td>AF (14% vs. 13.4%)</td>
<td>AF (17% vs. 15%)</td>
<td>AF (26 vs. 25)</td>
<td>AF (29 vs. 31)</td>
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<td></td>
<td>CAD (31 vs. 31)</td>
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<td>HHD (14 vs. 12)</td>
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<td>DCM (9 vs. 10)</td>
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<td>AF (7 vs. 8)</td>
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<td>EF (%)</td>
<td>34.4 vs. 33.7</td>
<td>30.2 → 31.1 (at 6 days)</td>
<td>29 → 30.2 vs.</td>
<td>29.3 → 30.2 vs.</td>
<td>ND</td>
<td>30.3 → 31.3 vs.</td>
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</table>
| Starting and ending serum creatinine (mg/dl) | 1.61 → 2.2 vs. 1.55 → 1.97 vs. 1.5 → 2.1 vs. 1.55 → 2.1 vs. 1.56 → 1.97 vs. 1.56 → 1.54 vs. 1.56 → 1.45 vs. 1.65 → 1.95 vs. | 1.65 → 1.62 vs. 1.51 → 1.55 vs. 1.56 → 1.54 vs. 1.56 → 1.45 vs. 1.65 → 1.95 vs. | 250 mg then 125 mg furosemide groups: 1.47 → 2.0, 1.49 → 2.3, 1.49 → 1.97, 1.47 → 2.2 vs. 1.45 → 1.48, 1.46 → 1.75, 1.46 → 1.49, 1.48 → 1.74 | 56 → 117 | 56.1 → 98 | 56.5 → 105 | 56.5 → 105 | 250 mg then 58.2 → 97
<table>
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<tr>
<th>and ending BUN (mg/dl)</th>
<th>vs.</th>
<th>vs.</th>
<th>vs.</th>
<th>vs.</th>
<th>125 mg furosemide groups:</th>
<th>vs.</th>
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<td>58.2 → 73.3</td>
<td>62 → 65</td>
<td>58.5 → 68.4</td>
<td>58.5 → 68.4</td>
<td>53 → 102, 53 → 115, 52 → 93, 52 → 101 vs. 53 → 52, 50 → 71, 52 → 51, 51 → 68</td>
<td>62 → 70</td>
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</table>

AF = atrial fibrillation, DCM = dilated cardiomyopathy, DM = diabetes mellitus, EF = ejection fraction, LS = low sodium, L = liter of fluid given, BID = twice daily, ND = no data, NS = normal sodium, Na = sodium, NYHA = New York Heart Association, CHF = congestive heart failure, HSS = hypertonic saline solution, HHD = hypertensive heart disease. Listed first are data obtained from patients receiving a low sodium diet with data from patients assigned to a normal sodium diet following.
**Supplemental Table 2**

Quality of Published Studies Reporting Use of a Low Sodium Versus a Normal Sodium Diet

<table>
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<tr>
<th>Author, Year (Reference)</th>
<th>Jadad Score</th>
<th>Allocation Concealment</th>
<th>Similarity of Baseline Characteristics</th>
<th>Eligibility Criteria</th>
<th>Blinding</th>
<th>Completeness of follow up</th>
<th>Intention-to-Treat Analysis</th>
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<tr>
<td>Parrinello 2009</td>
<td>5</td>
<td>Yes</td>
<td>Yes</td>
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<td>Licata 2003</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>Paterna 2005</td>
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<td>Paterna 2008</td>
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