

FULL TEXT LINKS



Sci Rep. 2018 Jan 10;8(1):254. doi: 10.1038/s41598-017-18537-x.

# Novel haemodialysis (HD) treatment employing molecular hydrogen (H<sub>2</sub>)-enriched dialysis solution improves prognosis of chronic dialysis patients: A prospective observational study

Masaaki Nakayama <sup>1 2 3</sup>, Noritomo Itami <sup>4</sup>, Hodaka Suzuki <sup>5</sup>, Hiromi Hamada <sup>4</sup>, Ryo Yamamoto <sup>6</sup>, Kazumasa Tsunoda <sup>7</sup>, Naoyuki Osaka <sup>8</sup>, Hirofumi Nakano <sup>9</sup>, Yukio Maruyama <sup>10</sup>, Shigeru Kabayama <sup>11 12</sup>, Ryoichi Nakazawa <sup>13</sup>, Mariko Miyazaki <sup>11 12</sup>, Sadayoshi Ito <sup>11</sup>

Affiliations

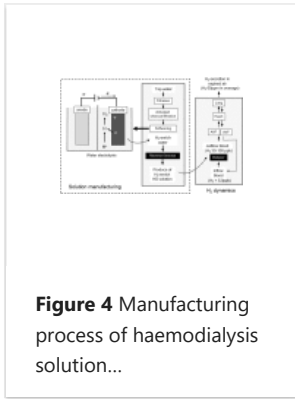
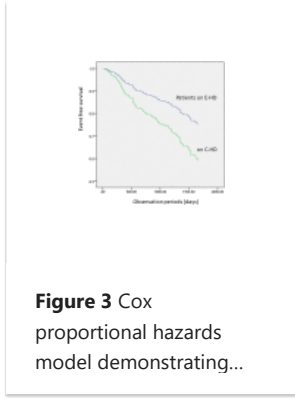
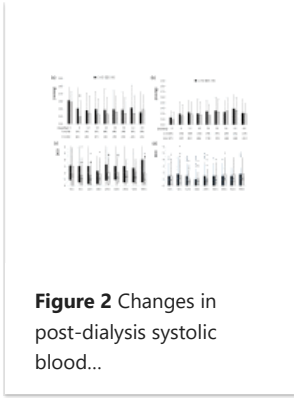
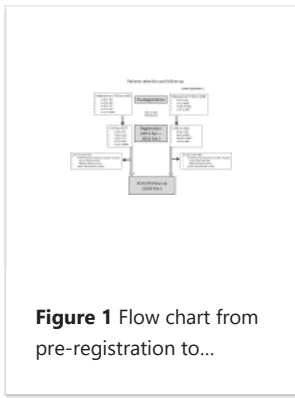
PMID: 29321509 PMID: [PMCS5762770](#) DOI: [10.1038/s41598-017-18537-x](#)

[Free PMC article](#)

## Abstract

Recent studies have revealed unique biological characteristics of molecular hydrogen (H<sub>2</sub>) as an anti-inflammatory agent. We developed a novel haemodialysis (E-HD) system delivering an H<sub>2</sub> (30-80 ppb)-enriched dialysis solution by water electrolysis, and conducted a non-randomized, non-blinded, prospective observational study exploring its clinical impact. Prevalent chronic HD patients were allocated to either the E-HD (n = 161) group or the conventional HD (C-HD: n = 148) group, and received the respective HD treatments during the study. The primary endpoint was a composite of all-cause mortality and development of non-lethal cardio-cerebrovascular events (cardiac disease, apoplexy, and leg amputation due to peripheral artery disease). During the 3.28-year mean observation period, there were no differences in dialysis parameters between the two groups; however, post-dialysis hypertension was ameliorated with significant reductions in antihypertensive agents in the E-HD patients. There were 91 events (50 in the C-HD group and 41 in the E-HD group). Multivariate analysis of the Cox proportional hazards model revealed E-HD as an independent significant factor for the primary endpoint (hazard ratio 0.59; [95% confidence interval: 0.38-0.92]) after adjusting for confounding factors (age, cardiovascular disease history, serum albumin, and C-reactive protein). HD applying an H<sub>2</sub>-dissolved HD solution could improve the prognosis of chronic HD patients.

## Figures



## Related information

[PubChem Compound \(MeSH Keyword\)](#)

## LinkOut - more resources

### Full Text Sources

[Europe PubMed Central](#)  
[Nature Publishing Group](#)  
[PubMed Central](#)

### Other Literature Sources

[scite Smart Citations](#)

### Medical

[MedlinePlus Health Information](#)

### Research Materials

[NCI CPTC Antibody Characterization Program](#)