Synthèse bibliographique

Importance of normohydration for the long-term survival of haemodialysis patients

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Objectif de l'étude

Mettre évidence l'impact de l'hyperhydratation sur la survie des patients dialysés

Etendue et méthodes de l'Etude

Une Population de dialysés sélectionnés positivement (Tassin - 50 Patients) comme population de référence et comparées à deux groupes de patients de Giessen, un groupe de patients normohydratés (123) et un groupe de patients hyperhydratés.

Les mesures ont été réalisées en 2003 et le suivi a été de 6.5 années

La référence d'hyperhydratation prise est l'hyperhydratation relative en % du volume Extra Cellulaire

$$(\Delta HS_{rel} = \Delta HS/ECW)$$

Fluid overload and mortality

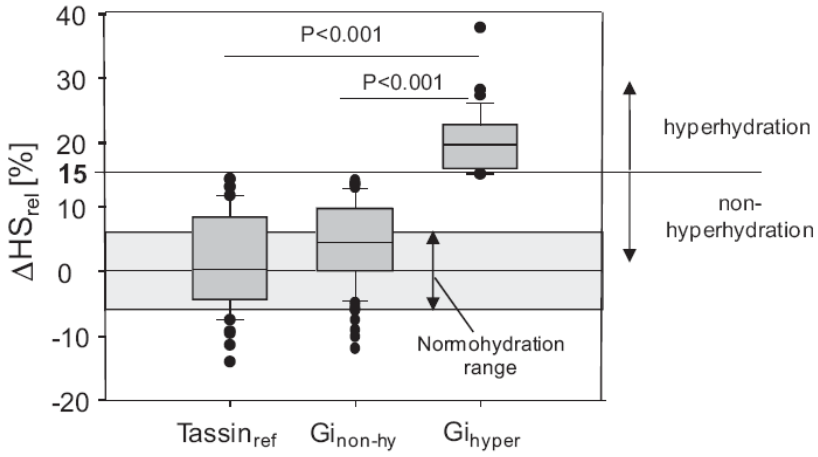

Fig. 1. Comparison of the relative hydration status before the dialysis (ΔHS_{rel}) between Tassin ($Tassin_{ref}$), Giessen non-hyperhydrated (Gi_{non-hy}) and hyperhydrated patients (Gi_{hyper}). Depicted in grey is the normohydration range of healthy subjects with normal kidney function ($-7\% \leq \Delta HS_{rel} \leq 7\%$). Additionally, the range of hyperhydration and non-hyperhydration is shown.

Le tableau 1 donne la répartition des groupes après inclusion et donne les éléments de différences significatives entre groupes.

Table 1. Tassin and Giessen patient characteristics[a]

	$Tassin_{ref}$	$Gi_{non\text{-}hy}$	Gi_{hyper}
N	50	123	35
Centre change	2	6	2
Transplanted	11	15	2
Percentage of male patients	44	47.9	54.3
Age (years)	72.5 ± 12.1*****	64.7 ± 13.8***	65.4 ± 14.4***
Dialysis vintage (years) (median, 25 and 75% percentile)	3.4; 1.82; 5.0	3.02; 1.2; 6.1	4.6; 2.3; 16.6
Dialysis time (hours 3× per week)	6.8 ± 1.3	4.5 ± 0.3	4.5 ± 0.3
Dialysate sodium (mmol/L)	138.0 ± 0.1	138.9 ± 1.7	138.6 ± 1.9
Pre-weight (kg)	72.1 ± 19.1	74.0 ± 13.0	67.3 ± 15.8
Serum sodium (mmol/L)	135.3 ± 3.5*****	138 ± 2.7***	137.7 ± 3.2***
IDWG (%)	2.2 ± 1.3*****	3.1 ± 1.0***	3.3 ± 1.3***
Observation period (years)	6.0 ± 0.0	6.6 ± 0.5	6.4 ± 0.5
Height (cm)	162.3 ± 10.1	166.1 ± 9.5	166.5 ± 9.6
BMI (kg/m^2)	27.2 ± 6.2	26.9 ± 5.1	24.1 ± 3.1
Prevalence of diabetes (%)	14 (30% in total Tassin population)	37	23
Haematocrit (HCT) (%)	37.5 ± 4.0*****	33.9 ± 4.1***	33.0 ± 4.2***
% Patients with HCT <30%	4****	14**	23**
% Patients with HCT >36%	72*****	25***	23***
Erythropoetin (EPO) (IU/week)	3590 ± 3970	5015 ± 5250	5320 ± 4990
% Patients on EPO	76	70	71
Iron (mg/week)	21.6 ± 19.3	37.0 ± 42	32.9 ± 32.7
% Patient on iron	76****	54**	60**
Albumin (g/L)	38.3 ± 3.2	41 ± 2.9	39.3 ± 3.7
ECW (L)	15.1 ± 3.5	16.2 ± 3.0	17.1 ± 3.7
ICW (L)	16.6 ± 3.7	17.9 ± 4.1	16.0 ± 3.8
TBW (L)	31.7 ± 6.9	34.2 ± 6.8	33.1 ± 7.3
BPpre sys (mmHg)	127 ± 17*****	139 ± 21***	140 ± 20***
BPpre dia (mmHg)	68 ± 11*****	76 ± 11***	74 ± 13***
BPpost sys (mmHg)	110 ± 22*****	132 ± 19***	140 ± 19***
BPpost dia (mmHg)	63 ± 11*****	75 ± 11***	76 ± 12***
Number of AHT p.patient	0.04 ± 0.2	1 ± 1.1	0.8 ± 0.8
% Patients on AHT	4	54	57
Hydration $status_{pre}$ (L)	0.25 ± 1.15*	0.8 ± 1.1*	3.5 ± 1.2*****
Hydration $status_{post}$ (L)	−1.25 ± 1.23*	−1.5 ± 1.4*	1.3 ± 1.4*****
Relative hydration $status_{pre}$ (%)	1.4 ± 7.5*	4.6 ± 6.3*	20.2 ± 4.8*****
Relative hydration $status_{post}$ (%)	−10.3 ± 10.9*	−11.8 ± 11.2*	8.1 ± 7.8*****
TAFO (L)	−0.5 ± 1.1*	−0.35 ± 1.2*	2.4 ± 1.6*****
Crude mortality per year (%)	6*	6.4*	11.2*****

[a]Tassin patients were regarded as the reference group ($Tassin_{ref}$). Giessen patients were subdivided into the non-hyperhydrated and hyperhydrated groups ($Gi_{non\text{-}hy}$ and Gi_{hyper}, respectively). For each parameter (except for the dialysis vintage), the mean and the SD are displayed. IDWG, interdialytic weight gain; AHT, anti-hypertensive drugs; TAFO, weekly time averaged fluid overload [(HS_{pre} + HS_{post})/2]; BMI, body mass index.
*****Significantly different to both other groups ($P < 0.001$).
****Significantly different to both other groups ($P < 0,05$).
***Significantly different to $Tassin_{ref}$ ($P < 0.001$).
**Significantly different to $Tassin_{ref}$.
*Significantly different to Gi_{hyper} ($P < 0.001$).

La « crude mortality » est respectivement de 6 et 6.4% par an pour les deux groupes normohydratés et de 11.2% par an pour le groupe hyperhydraté.

Résultats et conclusions

Table 2. Results of the multivariate Cox adjusted model[a]

	Hazard ratio	Confidence low	Confidence high	Significance
Gender (male/female)	1.34	0.86	2.08	0.20
Age (1/a)	1.05	1.02	1.07	<0.0001
Diabetes (yes/no)	1.85	1.15	2.99	0.01
Haematocrit (1/%)	0.92	0.87	0.97	<0.0001
BPsys pre (1/mmHg)	1.00	0.99	1.01	0.65
Dialysis vintage (log)	0.89	0.76	1.04	0.15
BMI (1/kg/m^2)	0.96	0.91	1.01	0.09
Albumin (1/g/L)	0.92	0.85	0.99	0.02
$Gi_{non\text{-}hy}$	1.26	0.66	2.41	0.48
Gi_{hyper}	3.41	1.62	7.17	<0.0001

[a]The $Tassin_{ref}$ patient group was chosen as reference (hazard ratio = 1). BMI, body mass index.

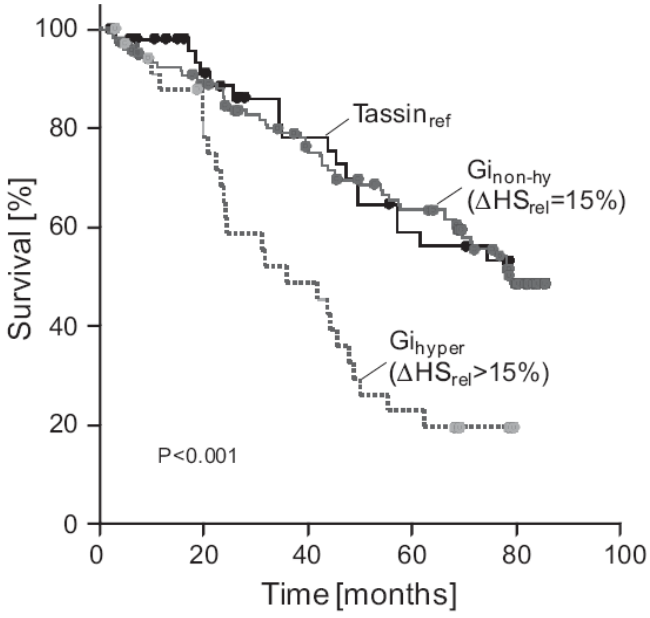

Fig. 3. Unadjusted Kaplan–Meier analysis for the three patient groups ($Tassin_{ref}$, $Gi_{non\text{-}hy}$, Gi_{hyper}) and the follow-up period of 6.5 years. All-cause mortality was considered as event.

L'hyperhydratation est prédictive de la mortalité, des marqueurs indirects de l'hyperhydratation tels que la pression sanguine sont nettement moins prédictifs
Le bénéfice pour les patients de l'évaluation de l'hyperhydratation peut être important en terme de survie.