Patterns of Intradialytic Hypotension- Clinical Associations

IULIA GROSU [1], FLAVIU BOB [1], OANA SCHILLER [2], ADALBERT SCHILLER [1]

1 – Nephrology Department, "Victor Babes" University of Medicine and Pharmacy, Timisoara, Romania

2- BBraun Hemodialysis Center, Timisoara, Romania

Background and Aim

- Intradialytic hypotension (IDH)- common complication associated with HD sessions

    - prevalence of HD sessions with this complication = 10,1%

    - depending on IDH definition

- IDH is associated with:

    - myocardial stunning

    - cerebral ischemia

    - mesenteric ischemia

    - vascular access failure (arterio-venous fistula thrombosis)

    - higher overall mortality and morbidity

| Definitions for intradialytic hypotension	Year	Decrease in SBP (mmHg)	Nadir in SBP (mmHg)	Decrease in MAP (mmHg)	Need for symptoms or intervention	Large epidemiological (n > 1000) or interventional (n > 100) study using this definition
KDOQI Clinical Practice Guidelines [6]	2005	≥20	ND	≥10	Symptoms	Retrospective cohort of 39 497 HD patients [7]
UK Renal Association Guidelines [8]	2011	Any	ND	Any	Immediate intervention	Cross-sectional study with 2193 HD patients [9]
European Best Practice Guidelines [10]	2007	≥20	ND	≥10	Symptoms and intervention	–
Japanese Society of Dialysis Therapy Guidelines [11]	2012	≥30	ND	≥10	Symptoms	–
Chou et al. [12], USA	2018	ND	<90	ND	ND	5-year cohort of 112 013 HD patients
Sands et al. [13], USA	2014	≥30 to a level of <90 mmHg	<90	ND	ND	Epidemiologic study of 1137 HD patients

Kanbay et al. , An update review of intradialytic hypotension: concept, risk factors, clinical implications and management, Clinical Kidney Journal, 2020, vol. 13, no. 6, 981–993 doi: 10.1093/ckj/sfaa078

Background and Aim

HELLENIC SOCIETY OF NEPHROLOGY
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Recognized risk factors: high interdialytic weight gain, diabetes mellitus, ischemic heart disease, older age, female sex, higher BMI.

→ Timing of IDH has not been extensively studied
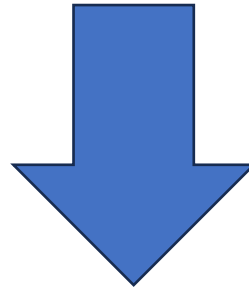
AIM: To identify whether IDH occurrence patterns are associated with any clinical or dialysis-related factors.
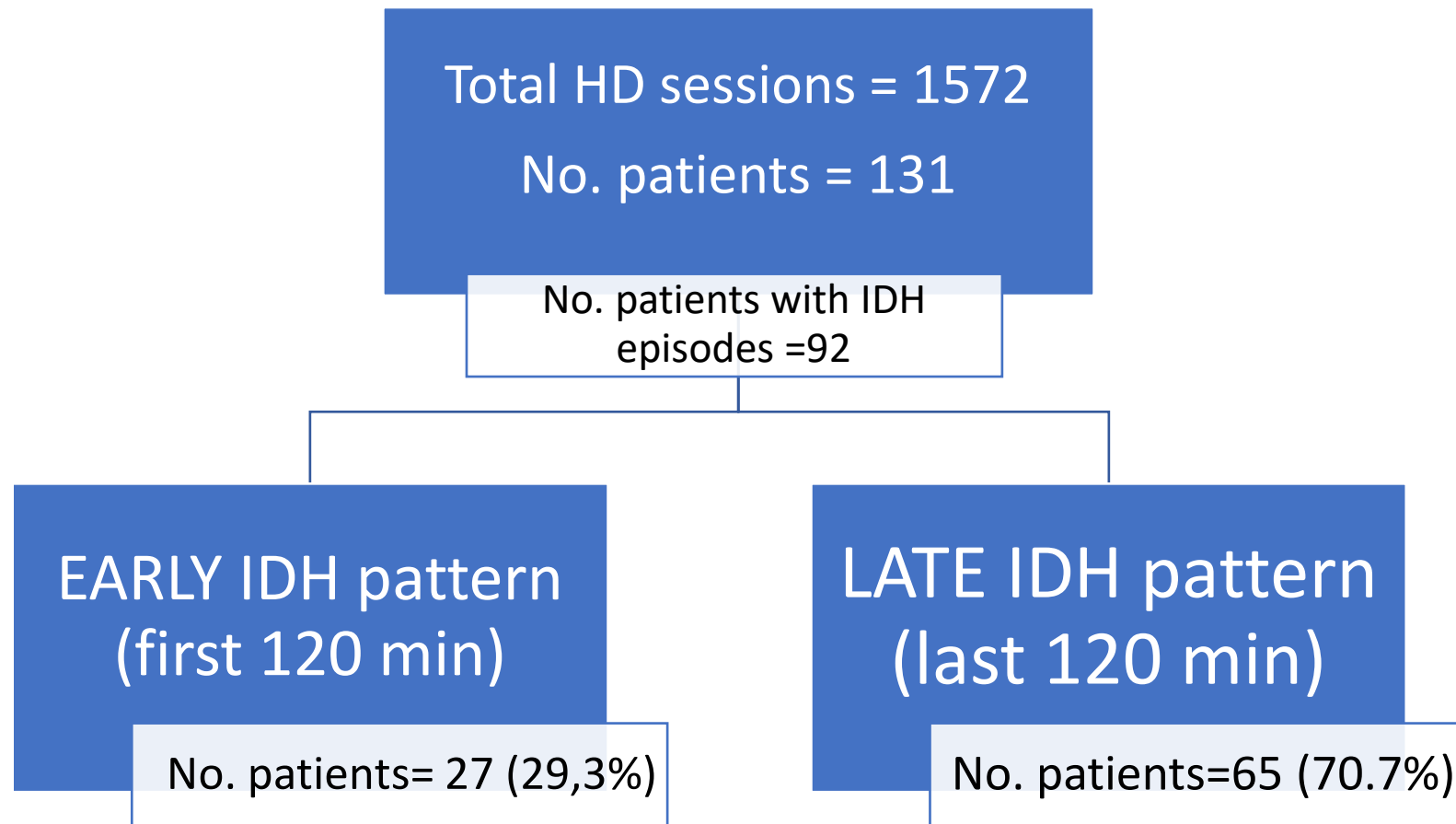
Material and Methods

- Prospective, observational study

- 131 patients → 1572 dialysis sessions (3 sessions/week, 4 weeks)

- Blood pressure recordings/session (pre-HD, 60', 120', 180`, 240')

- KDOQI IDH definition - decrease in systolic blood pressure (SBP) by ≥20 mm Hg or a decrease in mean arterial pressure (MAP) by 10 mm Hg associated with symptoms

- Recordings in the month of assessment

    - demographic factors, comorbidities, Subjective Global Assessment scale (SGA), dialysis prescription (Qb, Qd, dialysate composition), residual diuresis, vascular access, comorbidities (diabetes mellitus, heart disease – left ventricular hypertrophy, atrial fibrillation)

    - hemoglobin, plasma albumin, ferritin, PTH, calcium, phosphorus, C-reactive protein

Results

- Stratification on EARLY IDH VS LATE IDH based on > 50% frequency of IDH events

Total HD sessions = 1572

No. patients = 131

No. patients with IDH episodes =92

EARLY IDH pattern (first 120 min)

No. patients= 27 (29,3%)

LATE IDH pattern (last 120 min)

No. patients=65 (70.7%)

Results

VARIABLES	EARLY IDH PATTERN		LATE IDH PATTERN	
		p		p
Dialysis vintage (years, mean ±std)	5,91 ± 4,2	N.S.	7,8 ± 3,1	N.S.
Age (years, mean ± std)	63.03 ± 12.84	N.S.	65,2±13	N.S.
Albumin (g/dl, mean ±std)	4.2 ± 2.16	N.S.	4.4 ± 1.16	N.S.
C-reactive protein (mg/dl, mean ±std)	0.9 ± 1.1	N.S.	1 ± 1.2	N.S.
Dry weight (kg, mean ±std)	80.42±20.98	N.S.	65.2±10.98	N.S.
Ferritin (mcg/l, mean ±std)	**865 ± 401.99**	**p=0,004**	465 ± 202	N.S.
Hb (g/dl, mean ±std)	11.11 ± 1.14	N.S.	10.11 ± 1.5	N.S.
iPTH (pg/dl, mean ±std)	506.26 ± 594.91	N.S.	608 ± 493.1	N.S.
Atrial fibrillation (1/0)	5	N.S.	10	N.S.
Residual diuresis (ml, mean ±std)	700 ±500	N.S.	1200 ± 800	p=0.006
UF rate (ml/h)	450 ± 200	N.S	1099 ±254	p=0.05
SGA (mean ±std)	**9.20 ± 1.74**	**p=0,004**	7.5 ±1.5	N.S.
Diabetes mellitus (1/0)	7	N.S.	7	N.S.

Conclusion

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Different patterns of IDH onset characterize different clinical associations

- patients with early onset IDH tend to have higher SGA scores and ferritin levels → Inflammation as a possible underlying mechanism?

- patients with late onset IDH have a lower residual urinary output and a higher UF rate → hemodynamic mechanism

clinical investigation   www.kidney-international.org

The time of onset of intradialytic hypotension during a hemodialysis session associates with clinical parameters and mortality

Check for updates

see commentary on page 1269
OPEN

David F. Keane[1,2,3], Jochen G. Raimann[1], Hanjie Zhang[1], Joanna Willetts[4], Stephan Thijssen[1] and Peter Kotanko[1,5]

NOT ALL IDH ARE CREATED EQUAL → tailoring HD prescription and IDH management

Thank you!