

Biocompatible solutions reduce the incidence peritoneal hyalinizing vasculopathy, a lesion with uncertain significance.

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Introduction

- ✓ Peritoneal fibrosis and hyalinizing vasculopathy (HV) are consequences of medium-term peritoneal dialysis (PD) treatment.
- ✓ Bioincompatible fluids induce mesothelial cell denudation and peritoneal fibrosis which is reduced using biocompatible solutions.
- ✓ Few studies have focused on the potential influence of biocompatibility on HV development.
- ✓ HV is due to the reduplication of peritoneal basement membrane.

Objectives

- 1- To evaluate the influence of biocompatibility of the peritoneal dialysis solutions on the development of VH
- 2- To analyse the factors associated to its presence

Patients and Methods

- Case-control study matched for time on PD.
- 46 biopsies from PD patients:
 - 23 with biocompatible solutions (*Biocompatible group, BG*)
 - 23 with conventional solutions (*Control Group, CG*)
- The majority of biopsies were obtained during kidney transplant
- No biopsy was done during peritoneal inflammation or due to functional related problems.

Histological measures:

- Mesothelial integrity (0: Absent; 3: Preserved)
- Epithelial-to-mesenchymal (EMT): Presence of submesothelial fibroblasts cytokekeratin (+)
- Submesothelial thickness
 - 0: <150 µm
 - 1: 150-350 µm
 - 2: >350 µm
- Hyalinizing vasculopathy (0: Absent; 1: Mild; 2: Moderate; 3: Severe)(Honda et al. CJASN 2008)

Patients in BG: Physioneal®(7), Bicarbonate®(6), Balance®(5), Gambrosol®(5)
Patients in CG: Dianeal®(21), Stay-Safe®(2)

Table 1. Patients characteristics according to PD solution

	CONTROL (n=23)	BIOCOMPATIBLE (n=23)	P
Age (years)	42±13	50±15	0.049
Gender (male)	11 (48%)	16 (70%)	0.13
Time on PD (months)	23.5±17	22.9±16	0.8
Automated PD	21 (91%)	11 (48%)	0.001
Diabetes	1 (4.3%)	3 (13%)	0.29
Prior peritonitis episode	6 (26.1%)	10 (43%)	0.21
Days of peritonitis	3±2	5.6±4	0.1
MTC-Urea (ml/min)	21.7±7	23.2±4	0.37
MTC-Creatinine (ml/min)	8.8±4	9±2.5	0.85
Ultrafiltration (ml/4h)	860±251	672±256	0.029
Accumulated glucose (Kg)	117±113	112±117	0.89

PD: Peritoneal dialysis; MTC: mass transfer coefficient

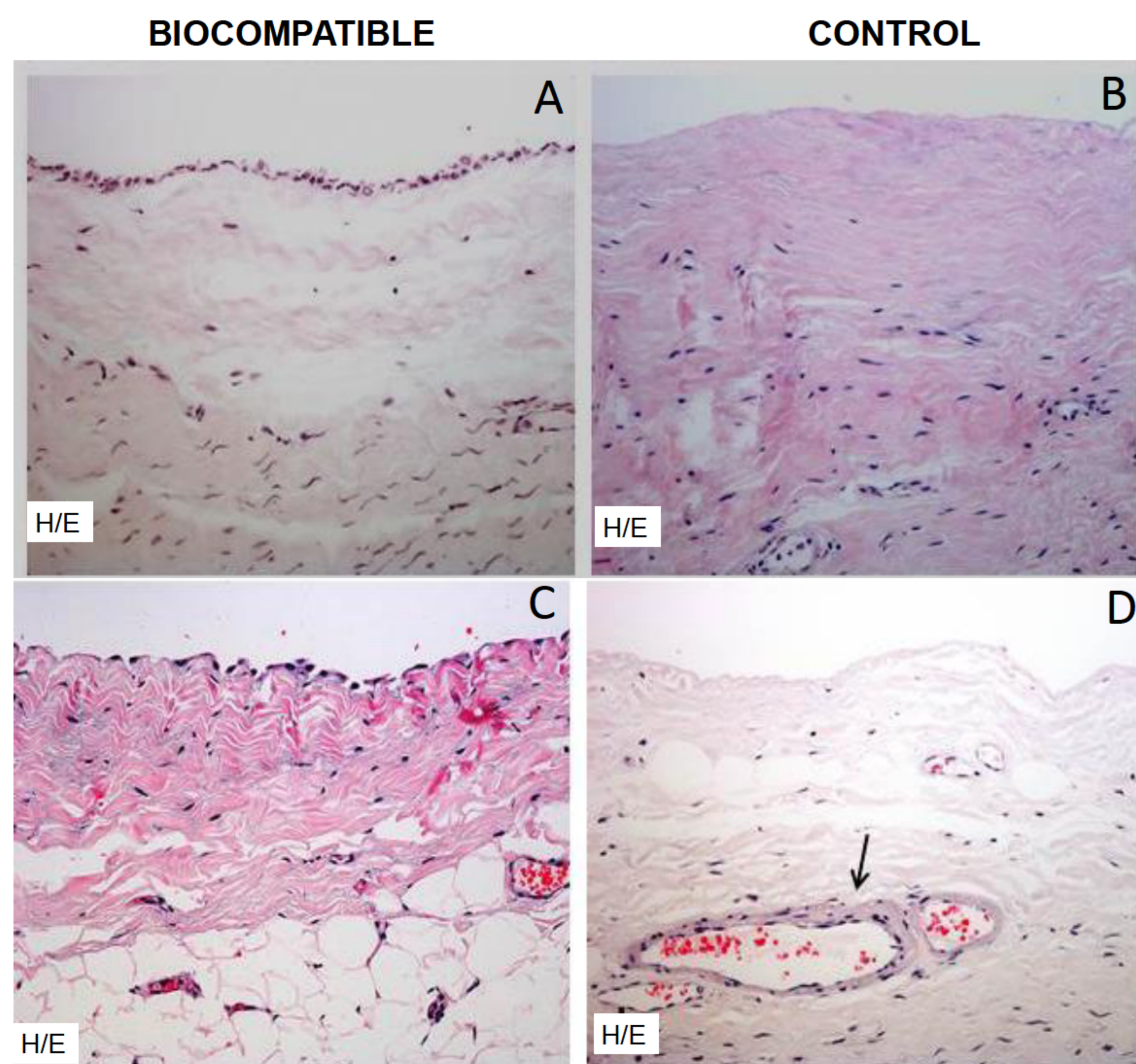


Figure 1. Better preservation of mesothelial cell layer and less fibrosis in BG (A, C) than in CG (B, D). Less presence of HV in BG (C) compared to CG (D). H/E: Hematoxylin/Eosin

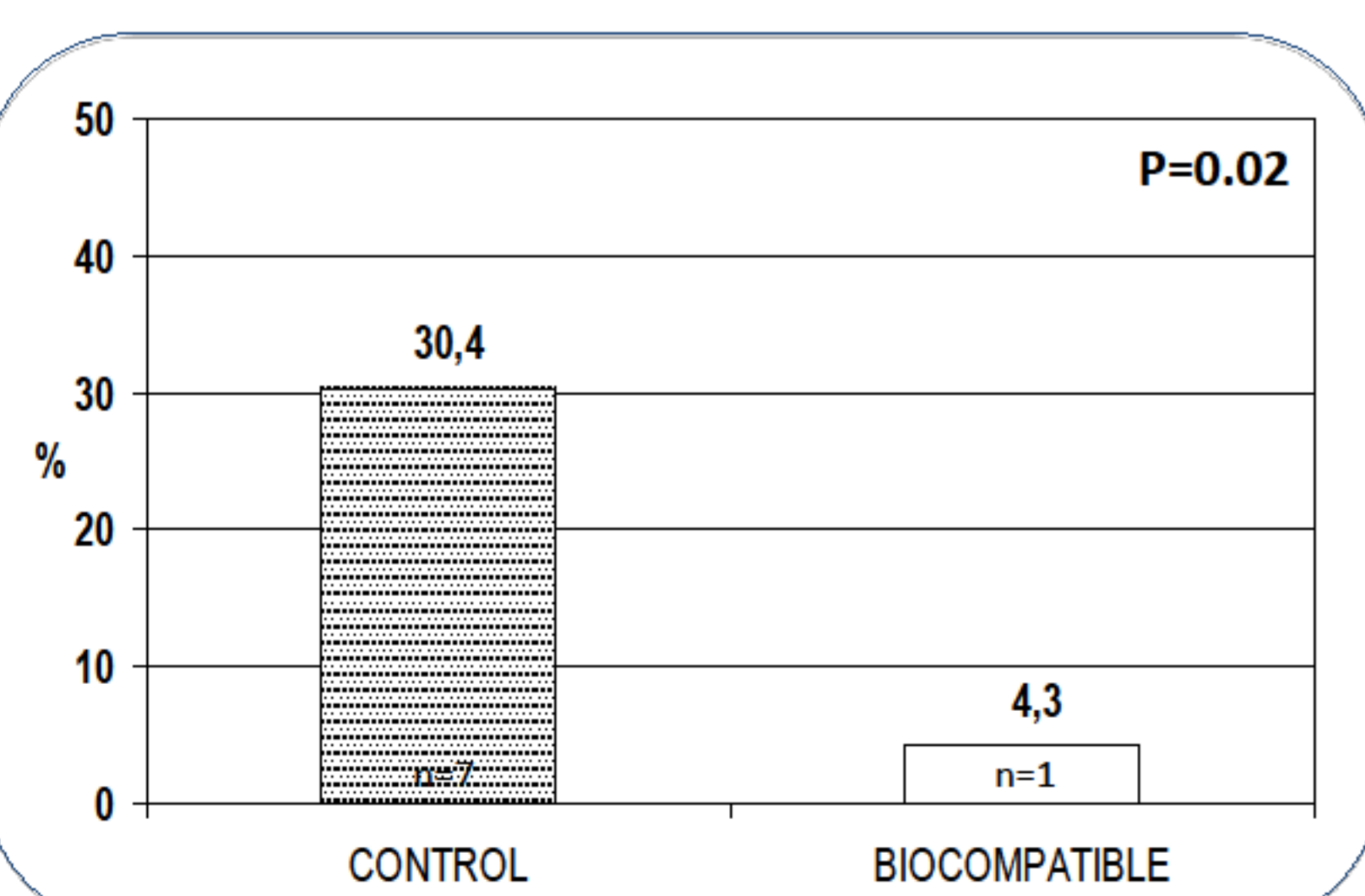
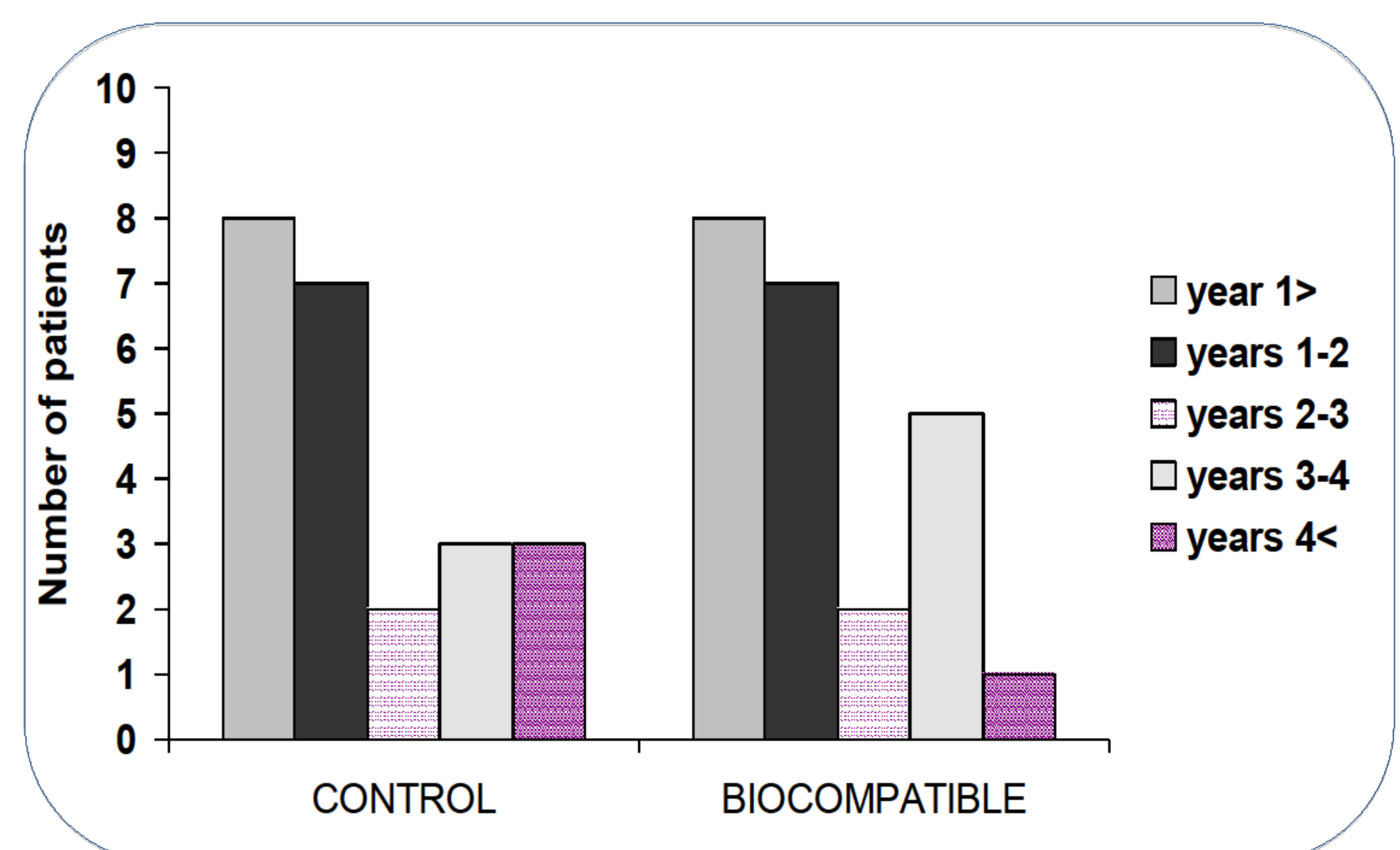


Figure 2. Prevalence of HV according to PD solution

All patients with HV showed partial or total mesothelial cell layer loss (p=0.016) and some degree of fibrosis (p=0.016). In addition, 75% of them presented EMT.



Logistic Regression Analysis

The use of conventional solutions was the only factor associated with the presence of HV (p=0.043), independently of age, time on PD, peritonitis or diabetes status.

Conclusion

- Biocompatible PD solutions induce less hyalinizing vasculopathy than bioincompatible PD fluids.
- The mechanisms of HV are unknown and deserve to be explored in future studies.