Endomyocardial Parvovirus B19 DNA detection is not associated with silent human heart ischemia or aortocoronary bypass surgery.

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Introduction and purpose

- Cardiotropic viruses are now suspected to be etiological causes or cofactors in the development of idiopathic dilated cardiomyopathy (iDCM) [1].
- The role of Parvovirus B19 (PVB19) is still debated and its impact on heart is suspected to be mainly mediated by an ischemic mechanism. [2]
- We hypothesized that PVB19 DNA should be more frequently detected in ischemic cardiomyopathies than in other cardiomyopathies and assessed the presence of PVB19 DNA in patients who underwent Aorto-coronary bypass (a proxy of silent ischemic cardiomyopathy) comparatively to those who underwent valvular surgeries.

Patients & Methods

- Between 2013 and 2014, 72 right atrium tissues were sampled during extracorporeal circulation in patients who underwent cardiac surgery in Reims University Hospital (sex ratio M/F=5.54, mean age 67.3±10.0 years). Patient authorized consent was not required because this tissue is considered as a surgery waste. Patients were classified as heart valve surgery patients or aorto-coronary bypass surgery controls . Patients experiencing combined surgery with both aorto-coronary bypass and valvulvar replacement were classified among aorto-coronary bypass surgery patients.
- All right atrium samples were investigated for the presence of human PVB19 DNA using specific real–time assays (Argene Biomérieux®, France).
- Demographic and medical data including cardiovascular risk factors were retrospectively extracted from medical records by external reviewer (YNG).
- Qualitative variables were compared using Fischer exact test or Pearson Chi test if applicable. Quantitative variables were compared using Mann Whitney U test. A p value <0.05 was considered as significant. All variables with a p value < 0.10 were entered into a multiple logistic regression model. Statistical analyses were performed using Stat view 5.0 software (SAS institute).

Results

- Among the 72 patients sampled during extracorporeal circulation, 53 (73.6%) underwent Aorto-coronary bypass. Arterial Hypertension, diabetes mellitus, hypercholesterolemia and active smoking were present in 43, 20, 35 and 14 patients respectively. Aorto-coronary bypass was associated with male sex (94.3% vs 57.8% p=0.006), diabetes mellitus (35.8% vs 5.2% p =0.01) and appeared to be associated with active smoking (24.5% vs 5.2% p=0.09) but not with Arterial Hypertension, age and hypercholesterolemia (Table 1).
- PVB19 DNA detection was evidenced in 69.8% of patients who underwent aorto-coronary bypass comparatively to 84.2% of patients who underwent valvular surgeries (p=0.22) (figure 1A). Mean PVB19 viral loads were 2636 versus 1434 cp/ml (77.5 versus 42.2 cp/µg) (figure 1B) in Aorto-coronary bypass and valvular surgeries patient groups respectively (p=0.13) (Table 1).
- Male Sex and diabetes mellitus were associated independently with aorto-coronary bypass (p=0.01 and p=0.02 respectively) but not active smoking (p=0.12). When PVB19 DNA detection was forced in the model, it did not reach statistical significance (p=0.51).
- Results were the same when only detection of PVB19 viral load >500 cp/µg [3] was considered (data not shown).

Table 1: Presence of cardiovascular risk factors and PVB19 DNA detection among Aorto-coronary bypass surgery patients comparatively to Valvular surgery patients. P: P univariate analysis; OR: Odds ratio; CI95%: Confidence interval 95%; P: P multivariate analysis; * According to Fischer exact test. Hosmer and Lemeshow goodness of fit gives p= 0,60**

	all patients (n=72)	Aorto-coronary bypass surgery patients (n=53)	Valvular surgery patients (n=19)	P	OR	CI95%	P**
Male Sex n(%)	**61 (84.7)**	**50 (94.3)**	**11 (57.8)**	**0,0006***	**33.5**	**[3.1-361.2]**	**0.004**
Mean Age ± SD (years)	67.3±10.0	66.9±9.8	68.1±10.7	0.60			
Arterial hypertension n(%)	43 (59.7)	30 (56.6)	13 (68.4)	0.36			
Diabetes mellitus n(%)	**20 (27.7)**	**19 (35.8)**	**1 (5.2)**	**0,01**	**34.7**	**[1.8-664.4]**	**0.02**
Hypercholesterolemia n(%)	35 (48.6)	28 (52.8)	7 (36.8)	0,23			
Active smoking n(%)	**14 (19.4)**	**13 (24.5)**	**1 (5.2)**	**0,09***	8.4	[0.5-130.6]	0,12
Right atrium PVB 19 DNA detection n(%)	53 (73.6)	37 (69.8)	16 (84.2)	0,22	0.57	[0.11-3.0]	0.51
Mean PVB19 viral load ± SD (cp/µg)	66.8±140 .4	77.5 ±163,4	42,2±58.2	0,13			

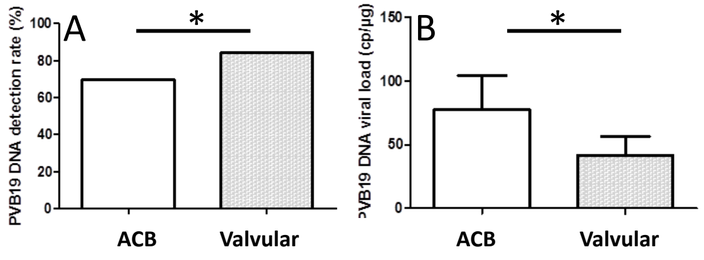

Figure 1A&B: PVB19 DNA Detection rate and viral loads among Aorto-coronary bypass surgery patients comparatively to Valvular surgery patients. ACB: Aorto-coronary bypass surgery patients; Valvular: Valvular surgery patients; * P= non significant.

Conclusion

- Our findings indicate that PVB 19 DNA detection is common in right atrium samples of patients who underwent cardiac surgery. Moreover PVB19 DNA detection does not appear to be associated with silent heart ischemia or aorto-coronary bypass surgery.

References & Acknowledgements

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