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Infection Risk in Endovascular Neurointerventions – A Comparative Analysis of 279 Cases With and Without Prophylactic Antibiotic Use

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Introduction

A systematic analysis on the utility of prophylactic antibiotics for endovascular neurointerventions has not been determined. At our institution we have the unique set-up to address this question with attendings using prophylactic antibiotics (cefazolin or vancomycin) for all neurointervention while others never do.

Methods

We performed a retrospective review of all neurointerventions at NYU Tisch Hospital (279 cases in 246 patients) between 2015 and 2016. Clinical and radiological data were collected for analysis including presence of prophylactic antibiotic use, local or systemic infection, infection laboratory values and treatment. Out of 279 neurointerventions 151 aneurysms, 72 AVM/AVF, 40 tumors and 16 vessel stenosis/dissections were treated with coiling (n=54), pipeline embolization device (n=97) embolization (n=112) or stenting (n=16), respectively.

Results

Antibiotic prophylaxis was used in 132 out of 279 cases (47%). There was no significant difference between patients with or without antibiotic prophylaxis in age (p=0.68), gender (p=0.08), presence of multiple interventions (p=0.85), diseases treated (p=0.46) and intervention device placed (p=0.84). Two mild local groin infections (0.7%) and no systemic infections (0%) were identified in this cohort with one case in each group (1/132, 0.75% vs. 1/147, 0.7%). Both patients recovered completely with local drainage (n=1) and antibiotic treatment (n=1).

Conclusions

The risk of infection associated with endovascular neurointerventions with or without prophylactic antibiotic use was very low in this cohort. The data suggest that the routine use of antibiotic prophylaxis seems unnecessary and should be reserved for selected patient in risk to prevent antibiotic resistance and to reduce costs.

Table 1: Characteristics of patients with and without antibiotic prophylaxis

Characteristics	All patients	with ABP	without ABP	p value*
N	246	118	128	
Sex, n (%)				p=0.08
Male	108 (44)	45 (38)	65 (51)	
Female	138 (56)	73 (62)	63 (49)	
Mean age, y (range)	54.6 (9-91)	55.1 (9-82)	54.1 (12-91)	p=0.68
Multiple interventions, n (%)	26 (11)	12 (10)	14 (11)	p=0.85

ABP, antibiotic prophylaxis; n, number; y, year; asterisk shows p value between patients with and without antibiotic prophylaxis

Table 2: Comparison of neurointerventions in patients with and without antibiotic prophylaxis

Characteristics	All interventions	with ABP	without ABP	p value*
N	279	132	147	
Lesion treated, n (%)				p=0.46
Aneurysm	151 (54)	76 (58)	75 (52)	
AVM/AVF	72 (26)	22 (17)	50 (34)	
Tumor	40 (14)	29 (22)	11 (7)	
Vessel Stenosis	16 (6)	5 (4)	11 (7)	
Type of intervention, n (%)				p=0.84
Embolization	112 (40)	51 (39)	61 (42)	
Coiling	54 (19)	27 (21)	27 (18)	
PED	97 (35)	48 (36)	49 (33)	
Stent	16 (6)	6 (4)	10 (7)	

ABP, antibiotic prophylaxis; n, number; y, year; AVM, arteriovenous malformation; AVF, arteriovenous fistula; PED, pipeline embolization device; asterisk shows p value between patients with and without antibiotic prophylaxis