

# INFECTIVE ENDOCARDITIS: THE LEBANESE EXPERIENCE



**Zeina Kanafani, MD, MS, CIC**

**Assistant Professor of Medicine**

**American University of Beirut**



## **Infective Endocarditis at a Tertiary Care Centre in Lebanon: Predominance of Streptococcal Infection**

**Z. A. Kanafani, T. H. Mahfouz and S. S. Kanj\***

*Division of Infectious Diseases, Department of Internal Medicine, American University of Beirut Medical Centre,  
PO Box 113-6044, Hamra 110 32090, Beirut, Lebanon*

“Unlike data reported from the US and northern Europe, this study confirms that in Lebanon, a developing country, we continue to have a **predominance of streptococci** as etiologic agents, and **rheumatic heart disease as the most common underlying heart condition**”

# Difficult To Study

- + **Low incidence** of the disease
- + Heterogeneous nature of populations at risk
- + **Variability** in underlying risk factors, and infecting organisms
- + **Regional** variabilities
- + Mostly case reports, series, **single site studies**
- + **Small studies** not adequately powered to examine important groups (cardiac risk factors, particular microorganisms etc.)

*Launched in 1999, the **International Collaboration on Endocarditis** was established to facilitate a multinational, multicenter approach to the study of IE – a **global** approach*

- + Mixed retro/prospective
- + Adults admitted to AUBMC – Sep 1987 and Nov 2010 with a discharge diagnosis of IE
- + Possible and definite IE (modified Duke criteria)
- + **Nosocomial acquisition**: new onset of signs and symptoms occurring in a patient hospitalized for 48 hours or more

# AUBMC 1986-2010 – Patient Characteristics

Characteristics	Before 2001 (n=86)	After 2001 (n=80)	P
Age	48±18.2	59±17.8	<0.001
Male — no. (%)	53 (61.6)	60 (75.0)	0.06
Transferred — no. (%)	15 (17.4)	11 (13.9)	0.54
Co-morbidities — no. (%)			
Dialysis	1 (1.2)	4 (5.0)	0.15
Diabetes Mellitus	9 (10.5)	13 (16.3)	0.27
IVDU	0	1 (1.3)	0.48
HIV+	0	1 (1.3)	0.48
Cancer	2 (2.3)	11 (13.8)	0.01
Immunosuppression	2 (2.3)	6 (7.5)	0.12
Dental procedure — no. (%)	13 (15.1)	9 (11.3)	0.70
Other invasive procedures — no. (%)	7 (8.1)	11 (13.8)	0.51

# AUBMC 1986-2010 – Patient Characteristics

Characteristics	Before 2001 (n=86)	After 2001 (n=80)	P
Previous Endocarditis — no. (%)	7 (8.1)	12 (15)	0.16
Congenital Heart Disease — no. (%)	7 (8.1)	7 (8.8)	0.89
PVIE — no. (%)	17 (19.8)	24 (30)	0.13
Native valve predisposition — no. (%)			
RHD	13 (15.1)	13 (16.3)	0.84
Rheumatic heart MS	9 (10.6)	7 (8.8)	0.69
Non rheumatic MS	0	1 (1.3)	0.48
MI	15 (17.6)	12 (15)	0.65
Rheumatic heart AS	9 (10.6)	7 (8.8)	0.69
Non rheumatic AS	0	3 (3.8)	0.11
AI	10 (11.8)	5 (6.3)	0.22
Other	7 (8.1)	7 (8.8)	0.89

# AUBMC 1986-2010 – Patient Characteristics

Characteristics	Before 2001 (n=86)	After 2001 (n=80)	P
Catheters/lines — no. (%)			
Peripheral IV	4 (4.7)	8 (10.0)	<0.001
Chronic central catheter	1 (1.2)	2 (2.5)	0.61
Short term central catheter	2 (2.3)	5 (6.3)	0.26
AV fistula	1 (1.2)	2 (2.5)	0.61
Devices — no. (%)			
Pacemaker	2 (2.3)	7 (7.8)	0.09
AICD	0	1 (1.3)	0.48
Other	0	2 (2.5)	0.34
Acquisition — no. (%)			
Nosocomial	6 (7.0)	21 (26.3)	
Community	48 (55.8)	53 (66.3)	
Unknown	32 (37.2)	6 (7.5)	<0.001

**Nosocomial acquisition** accounted for a significantly higher number of **PVIE** vs. NVIE (11 [26.8%] vs. 16 [12.8%]; p = 0.03)



# AUBMC 1986-2010 – Clinical Manifestations

Findings	No. (%) of patients	
	Current study	ICE – Prospective cohort study [1]
Fever	145/160 (90.6)	2322/2428 (96)
Osler's nodes	5/160 (3.1)	77/2648 (3)
Roth spots	9/160 (5.6)	50/2649 (2)
Janeway lesions	5/160 (4.4)	123/2650 (5)
Vascular embolic event	32/160 (20)	456/2665 (17)
Conjunctival hemorrhage	5/160 (3.1)	122/2655 (5)
Splenomegaly	19/160 (11.9)	284/2662 (11)
Splinter hemorrhage	9/160 (5.6)	213/2655 (8)
New murmur	29/166 (17.5)	1068/2232 (48)
Worsening murmur	10/166 (6)	359/1787 (20)
Elevated rheumatoid factor	9/152 (5.9)	138/2549 (5)
Elevated C-reactive protein level	24/152 (15.8)	1632/2650 (62)
Elevated ESR	93/152 (61.2)	1611/2645 (61)
Hematuria	49/157 (31.2)	666/2587 (26)

# AUBMC 1986-2010 – Microbial Etiologies

Microorganisms	Before 2001 (n=86)	After 2001 (n=80)	P
<i>Staphylococcus aureus</i>	17 (19.8)	16 (20.0)	0.97
MRSA	5 (5.8)	3 (3.8)	0.72
MSSA	12 (14.0)	13 (16.3)	0.68
Coagulase-negative staphylococcus	5 (5.8)	9 (11.3)	0.20
<i>Streptococcus</i> species	34 (39.5)	21 (26.3)	0.07
Alpha-hemolytic streptococci	26 (30.2)	15 (18.8)	0.09
Viridans group streptococci	19 (22.1)	14 (17.5)	0.46
Beta-hemolytic streptococci	3 (3.5)	3 (3.8)	1.00
Group D streptococci	5 (5.8)	3 (3.8)	0.72
<i>Enterococcus</i> species	3 (3.5)	12 (15.0)	0.01

Patients with **Enterococcal** IE were significantly **older** than those with IE due to other organisms (66.3 ± 11.6 vs. 51.8 ± 18.8; p < 0.001)

# AUBMC 1986-2010 – Microbial Etiologies

Microorganisms	Before 2001 (n=86)	After 2001 (n=80)	P
Non-HACEK Gram negative	4 (4.7)	7 (8.8)	0.29
Enterobacteriaceae	1 (1.2)	4 (5)	0.12
<i>Pseudomonas</i> species	2 (2.3)	2 (2.5)	1.00
<i>Neisseria mucosa</i>	1 (1.2)	0	
HACEK Gram-negative	0	4 (5)	0.05
<i>Candida</i> species	1 (1.2)	2 (2.5)	0.61

- + A similar study published earlier in the **pediatric age group at our center** with similar findings

Bitar FF. et al. Acta Paediatr, 2000

- + **Data from neighboring countries are mixed**, some agreeing (Turkey, Saudi Arabia and Yemen) vs. others (Greece, Turkey, KSA, Tunisia)

1. Khaled AA et al. Heart Views 2010
2. Nashmi A. East Mediterr Health J 2007
3. Tugcu A. Turk Kardiyol Dern Ars 2009
4. Leblebicioglu H et al. Eur J Epidemiol 2006
5. Al-Tawfiq JA. Ann Saudi Med 2009
6. Loupa C. et al. Clin Microbiol Infect 2004

- + Independent risk factors associated with Staphylococci

- + IVDU

- + Use of implantable devices and CVCs

- + Diabetes mellitus

Fowler VG et al. JAMA 2005

- + **Enterococcal** IE were significantly **older** and more likely to have cancer

- + Enterococcal IE was also more likely to be **nosocomial** compared to streptococcal IE

1. McDonald JR et al. Am J Med 2005

2. Durante-Mangoni E et al. Arch Intern Med 2008

# AUBMC 1986-2010 – Outcome

Characteristics	Before 2001 (n=86)	After 2001 (n=80)	P
Septic pulmonary infarct	2 (2.4)	8 (10.5)	0.05
Paravalvular complication	12 (14.0)	17 (21.3)	0.22
Perforation	4 (4.7)	6 (7.5)	0.52
Abscess	7 (8.1)	10 (12.5)	0.35
Fistula	2 (2.3)	1 (1.3)	1.00
Prosthetic paravalvular complications	5 (5.8)	7 (8.8)	0.46
Dehiscence	3 (3.5)	3 (3.8)	1.00
New moderate/severe regurgitation	4 (4.7)	7 (8.8)	0.29
Embolization, non-stroke	13 (15.1)	19 (23.8)	0.16
New Congestive heart failure	21 (24.4)	12 (15.0)	0.13
Stroke	10 (11.6)	8 (10)	0.74
Intracardiac abscess	6 (7)	7 (8.8)	0.67
Persistent positive blood cultures	0	5 (6.3)	0.02
New conduction abnormality	2 (2.3)	2 (2.5)	1.00
Surgery	28 (32.6)	25 (31.3)	0.86
Length of stay – mean (SD)	36 (19.1)	25 (18.9)	<0.001
Mortality	13 (15.1)	13 (16.3)	0.84
Data in No. (%)			

## AUBMC 1986-2010 – Outcome

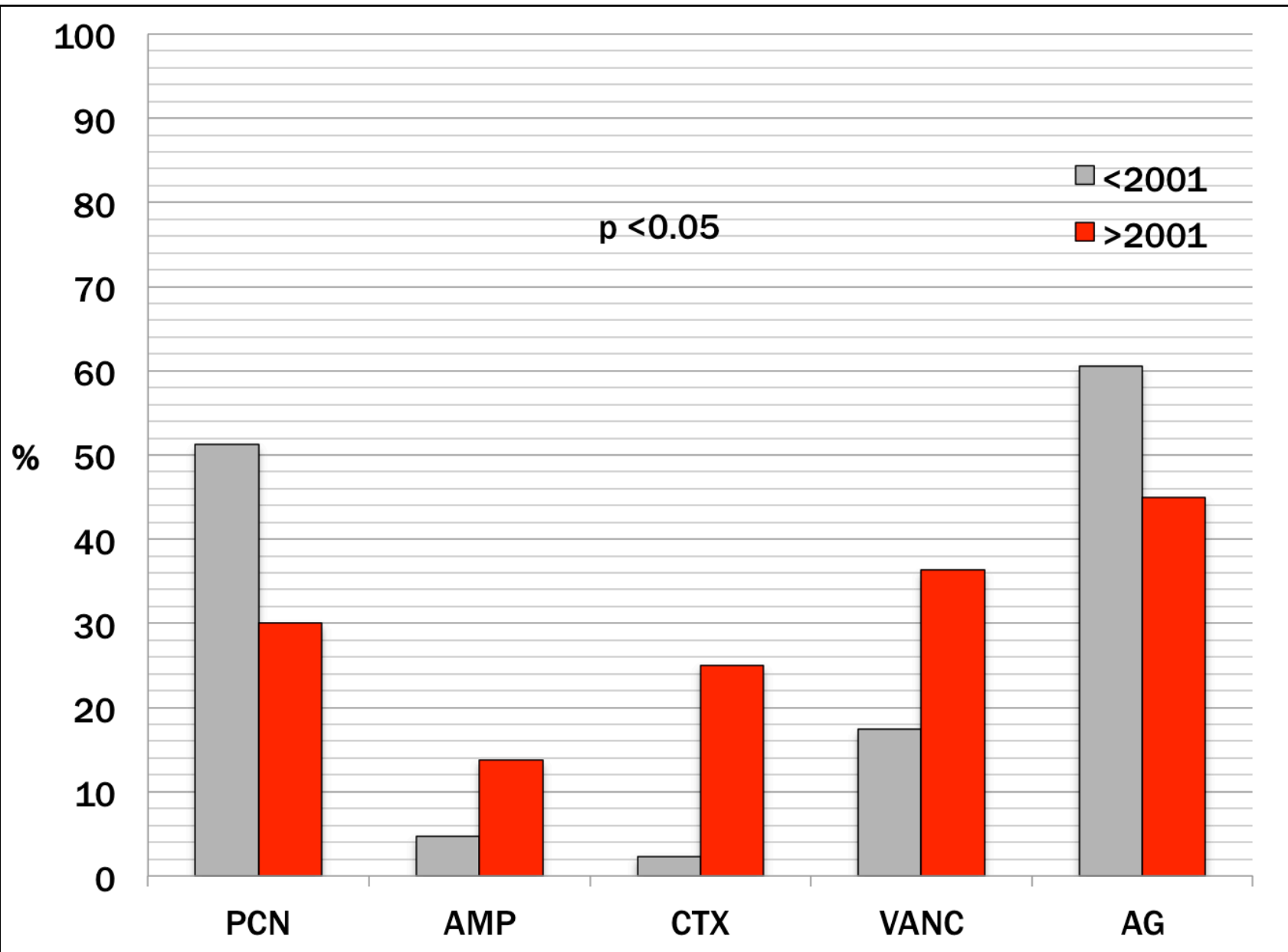
### Risk factors for paravalvular complications

Variable	Adj. OR	95% CI	p
Prosthetic valve endocarditis	6.4	6.0-6.8	0.01
Aortic location (vegetation)	7.5	7.0-8.0	<0.01

## AUBMC 1986-2010 – Treatment/ Surgery

- + Mean time to surgery from admission **15 ± 13 days** (range 1-58) – for patients with available documentation (49%)
- + Indications: significant valvular dysfunction 37 (69.8%), large or mobile vegetations 25 (47.2%), CHF 17 (32.1%)
- + **Operative mortality 6 (11.3%)** did not vary before or after 2001 (10.7% vs. 12%; NS)

# AUBMC 1986-2010 – Treatment/ Antibiotics





# AUBMC 1986-2010 – Comments/ Treatment

“There was **overuse of glycopeptide antibiotics** **unjustified** by the low percentage of MRSA isolates”

*Kanafani et al. Journal of Infection. 2002*

Encourage **surgery** when indicated – **reduces mortality**



**Thank**  
**You**