International Journal of Cardiology 181 (2015) 30–31

Contents lists available at ScienceDirect

International Journal of Cardiology

journal homepage: www.elsevier.com/locate/ijcard

Letter to the Editor

Acute Rheumatic Fever: A population-based study in Wallis, a South Pacific Island

Thomas Fauchier [a], Muriel Tafflet [a], Graziella Filitoga [b], Laurent Morisse [b], Eloi Marijon [a,c,d,e], Xavier Jouven [a,c,d,e], Mariana Mirabel [a,c,d,e,*]

[a] INSERM U970, Paris Cardiovascular Research Center — PARCC, Paris, France
[b] Agence de Santé de Wallis, Wallis Island
[c] Université Paris Descartes, Sorbonne Paris Cité, Paris, France
[d] Assistance Publique-Hôpitaux de Paris, Hôpital Européen Georges Pompidou, Paris, France
[e] Cardiology & Development, Paris, France

ARTICLE INFO

Article history:
Received 16 November 2014
Accepted 23 November 2014
Available online 27 November 2014

Keywords:
Epidemiology
Developing countries
Rheumatic Heart Disease
Acute Rheumatic Fever
Heart Valve Disease

Acute Rheumatic Fever (ARF), an autoimmune reaction to Group A Streptococcus, and its sequel, Rheumatic Heart Disease (RHD), remain endemic in many parts of the world, among which Pacific Islands [1]. Rheumatic Heart Disease still bears high mortality in the developing world with approximately 345,000 related deaths per year worldwide [2].

Our aim was to report the incidence of ARF in Wallis, a French overseas Island in the South Pacific populated by 8675 Polynesians, and divided into three districts [3]. Universal care includes routine echocardiography and penicillin delivered through three primary health centers that share a single web-based medical records system in which all visits are recorded. Tertiary care (e.g., cardiac surgery) is provided overseas, free of charge to the patient. All care provided to this captive population is collected in a single computer-based system.

We retrospectively reviewed all medical records of patients who attended any of the health centers with a final diagnosis of ARF or RHD from January 2005 to December 2013 in the island. We collected socio-demographic characteristics (sex, age, district of residence), clinical features of ARF, echocardiographic data (i.e., severity of valve disease according to standardized definitions) [4], treatment and outcomes. We collected serial echocardiograms' results and could assess regression, stability or progression of valve disease when present. Definition of stable valve disease included unchanged grade of severity of single or multiple valve disease. Definition of progression of valve disease was based either on the increased grade of isolated valve disease (e.g., mitral regurgitation previously grade 1/4 becoming grade $\geq$2/4 at FU) and/or newly diagnosed mitral regurgitation, aortic regurgitation and/or mitral stenosis. We performed a cross sectional follow-up in January 2014 by contacting the patient, his/her next of kin or general practitioner. All patients gave informed consent. The study protocol conforms to the Declaration of Helsinki and was approved by the institution's ethics committee [5].

There were 66 new cases among the 168 patients with a diagnosis of ARF or RHD who sought medical assistance during the study period. The ARF yearly incidence for the overall population was 2.67 per 10,000 inhabitants (95% CI 1.55–3.79), significantly higher among one of the three districts (1.48 (95% CI 0.18–2.78), 1.02 (95% CI 0–2.44) and 5.13 (95% CI 2.53–7.72), $p < 0.001$). The yearly ARF incidence among children aged 5 to 19 years was 11.16 per 10,000 (95% CI 5.86–16.47). Clinical characteristics at presentation are described in Table 1. The incidence of ARF was higher among males with a diagnosis at a younger age ($p = 0.03$ univariate analysis, Chi^2 test). The majority of patients, 44 (68.75%), presented with carditis, mostly with mild valve disease (Fig. 1). A minority of patients ($n = 5$) presented with RHD and no signs of ARF. After diagnosis, 65 (98.48%) were offered secondary prophylaxis (62 (93.94%) benzathine penicillin injections every 3 to 4 weeks; 8 (12.12%) oral treatment). Other medical treatment included ACE inhibitors in 2 cases (3.03%), betablockers in 2 cases (3.03%), and diuretics in 4 cases (6.06%). Serial echocardiograms were performed in 59 (89.39%) patients, with improvement of the initial valve disease in 8 (13.56%), stability in 30 (50.85%), and deterioration in 8 (13.56%) patients (missing data in 13 (22.03%) cases) at median follow-up time of 3 years (IQR 1.50; 5.50) (Fig. 1). Rheumatic Heart Disease was however present in 46/59 (77.97%) patients with serial follow-up. At a median follow-up time of 3 years, adverse outcomes were noted in 10 patients: 8 (12.12%) had an ARF relapse, and 2 (3.03%) patients underwent heart

* Corresponding author at: Paris Cardiovascular Research Center, Inserm U970, 56 Rue Leblanc, 75737 Paris CEDEX 15, France.
E-mail address: mariana.mirabel@inserm.fr (M. Mirabel).

http://dx.doi.org/10.1016/j.ijcard.2014.11.193
0167-5273/

Table 1
Characteristics at presentation according to sex.

Characteristics at first presentation	Male, N = 38	Female, N = 28	All, N = 66	Univariate p
Age diagnostic, mean (SD)	11.44 (4.32)	14.61 (6.95)	12.79 (5.76)	0.03
Acute Rheumatic Fever (ARF), n (%)	37 (97.37)	24 (92.31)	61 (92.31)	0.15
With carditis, n (%)	24 (63.16)	17 (62.96)	41 (61.54)	
With carditis and chorea, n (%)	1 (2.63)	0	1 (1.54)	
With chorea, n (%)	0	2 (7.14)	2 (3.03)	
Acute proliferative glomerulonephritis, n (%)	1 (2.63)	0	1 (1.52)	
Rheumatic Heart Disease, n (%)	1 (2.70)	4 (14.29)	5 (7.69)	0.16

valve surgery. No deaths were reported among the newly diagnosed cases during the study period.

We provide here valuable data on the burden of disease related to ARF in a small Pacific Island with the opportunity to accurately calculate population-based figures. The settings are unique since the population is captive during childhood with access to a single healthcare system sharing the same computer-based medical records. Acute Rheumatic Fever and RHD remain a public health issue among the young in spite of access to free of charge health care and high GDP per capita [6]. These figures are in keeping with reports from the Aboriginal population in neighboring Australia [7]. We found that the incidence of ARF was higher in some parts of the island, which should increase awareness among populations at higher risk. Although the sample is relatively small, RHD was present at follow-up in the majority of patients presenting with ARF suggesting that previous ARF or relapses may have gone undiagnosed. The relatively low rate of patients diagnosed at the stage of established RHD lesions may be due to the exodus of young and middle aged adults to other French Pacific Islands for economic reasons [6,8]. In such small settings active surveillance may be an alternative through echocardiographic-based screening either in schools or in the community [9,10].

Funding

No specific funding was granted for this work.

Conflict of interest

The authors report no relationships that could be construed as a conflict of interest.

Acknowledgments

We are grateful to the managers of the Agence de Santé, Wallis.

References

[1] E. Marijon, M. Mirabel, D.S. Celermajer, X. Jouven, Rheumatic heart disease, Lancet 379 (9819) (2012) 953–964.
[2] R. Lozano, M. Naghavi, K. Foreman, et al., Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010, Lancet 380 (9859) (2012) 2095–2128.
[3] L. Hadj, Wallis et Futuna: Recensement de la population de 2008:10% d'habitants en moins depuis 2003, Insee Première 1251 (2009) (http://www.insee.fr/fr/ffc/ipweb/ip1251/ip1251.pdf. 2008, accessed August 1st 2014).
[4] R.O. Bonow, B.A. Carabello, C. Kanu, et al., ACC/AHA 2006 guidelines for the management of patients with valvular heart disease: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (writing committee to revise the 1998 Guidelines for the Management of Patients With Valvular Heart Disease): developed in collaboration with the Society of Cardiovascular Anesthesiologists: endorsed by the Society for Cardiovascular Angiography and Interventions and the Society of Thoracic Surgeons, Circulation 114 (5) (2006) e84–e231.
[5] A.J. Coats, L.G. Shewan, Statement on authorship and publishing ethics in the International Journal of Cardiology, Int. J. Cardiol. 153 (3) (2011) 239–240.
[6] B. Buffière, J.P. Goepfert, Enquête Budget des Familles Wallis et Futuna 2005–2006: Synthèse des principaux résultats, http://www.spc.int/prism/wf/index.php/documents/doc_download/67-synthese2006 (accessed Ausgust 1st 2014).
[7] J.G. Lawrence, J.R. Carapetis, K. Griffiths, K. Edwards, J.R. Condon, Acute rheumatic fever and rheumatic heart disease: incidence and progression in the Northern Territory of Australia, 1997 to 2010, Circulation 128 (5) (2013) 492–501.
[8] K. Sliwa, M. Carrington, B.M. Mayosi, E. Zigiriadis, R. Mvungi, S. Stewart, Incidence and characteristics of newly diagnosed rheumatic heart disease in urban African adults: insights from the heart of Soweto study, Eur. Heart J. 31 (6) (2010) 719–727.
[9] E. Marijon, P. Ou, D.S. Celermajer, et al., Prevalence of rheumatic heart disease detected by echocardiographic screening, NEJM 357 (5) (2007) 470–476.
[10] A. Kane, M. Mirabel, K. Toure, et al., Echocardiographic screening for rheumatic heart disease: age matters, Int. J. Cardiol. 168 (2) (2013) 888–891.

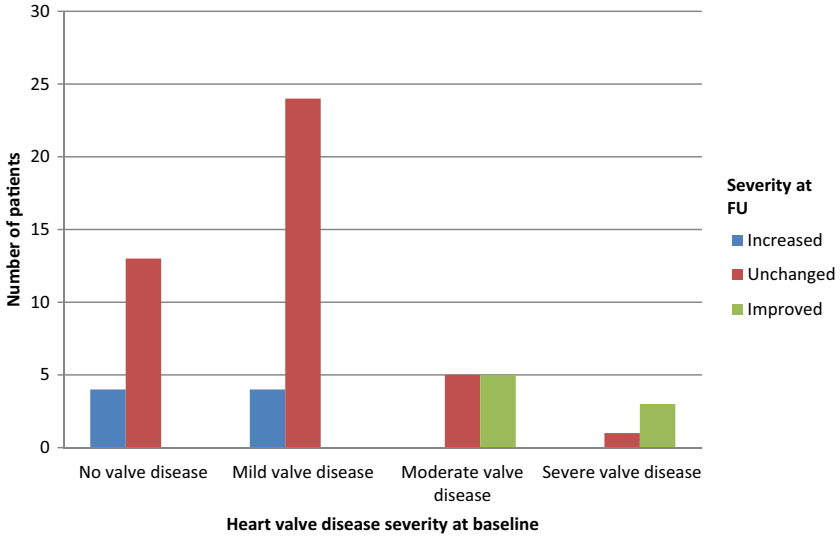

Fig. 1. Echocardiographic features at presentation and outcomes at follow-up: heart valve disease severity. Severity of valve disease was graded according to guidelines in use at the time of patients' diagnosis [4], with changes being encoded as increased severity, unchanged severity or improved severity. Missing data in 13 patients.