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CLINICAL RESEARCH

Prevalence of rheumatic heart disease in young adults from New Caledonia



Prévalence de la valvulopathie rhumatismale chez l'adulte jeune en Nouvelle Calédonie

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KEYWORDS

Rheumatic heart disease;
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Summary

Background. — Rheumatic heart disease (RHD) is an important public health issue, particularly in the Pacific region, but its true burden is unknown.

Objectives. — To evaluate the prevalence of rheumatic heart disease (RHD) in young adults from New Caledonia, based on echocardiography, and to evaluate the accuracy of dynamic criteria, focusing on mitral valve (MV) leaflet motion.

Methods. — Blind analysis of echocardiography by three cardiologists; diagnosis of RHD required at least one dynamic criterion (exaggerated or restricted MV leaflet motion); subjects with morphological criteria (MV leaflet thickening), but without dynamic criteria, were considered as borderline.

Results. — There were 834 subjects from three socioeconomic groups, aged 18–22 years: 699 had normal echocardiography; 93 (11.5%) had physiological regurgitation; nine (0.9%) had borderline RHD; and five (0.59%) had RHD. The prevalence of RHD in New Caledonia was thus estimated at 5.9 per 1000 (95% confidence interval 2.6–12.2). The RHD cases were of Pacific

Abbreviations: AR, aortic regurgitation; CI, confidence interval; MR, mitral regurgitation; MS, mitral stenosis; MV, mitral valve; RHD, rheumatic heart disease.

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MOTS CLÉS

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ethnicity. Physiological regurgitation was more frequent in Pacific subjects (13.7%) than in non-Pacific subjects (6.9%; $P < 0.0001$). RHD was more prevalent in the lowest socioeconomic group. No disagreement occurred between the three reviewers concerning analysis of dynamic criteria; all disagreements were related to morphological criteria.

Conclusions. — The prevalence of echocardiographically diagnosed RHD in adults in New Caledonia is estimated at 5.9 per 1000; it occurs most frequently in Pacific subjects and those with low incomes. Dynamic criteria were more accurate and reproducible than standard morphological criteria.

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Résumé

Contexte. — La valvulopathie rhumatismale (VR) est une importante question de santé publique, particulièrement dans la région Pacifique, mais son vrai fardeau est inconnu.

Objectifs. — Évaluer la prévalence de la VR chez l'adulte jeune en Nouvelle Calédonie, basé sur l'échocardiographie et évaluer la précision du critère dynamique, se concentrant sur les mouvements des feuillets de la valve mitrale (VM).

Méthode. — Analyse en aveugle des échocardiographies par trois examinateurs ; le diagnostic de VR requérant au moins un critère dynamique (mouvement exagéré ou restrictif d'un feuillet de la VM) ; les sujets avec des critères morphologiques (épaississement de feuillet de la VM), mais sans critère dynamique, sont considérés comme *borderline*.

Résultats. — Sur les 834 sujets des trois groupes socio-économiques, âgés de 18 à 22 ans : 699 avaient une échocardiographie normale ; 93 (11,5%) avaient une fuite physiologique ; neuf (0,9%) une VR *borderline* ; et cinq (0,59%) une VR avérée. La prévalence de la VR en Nouvelle Calédonie a été ainsi estimée à 5,9 pour mille (95%, intervalle de confiance 2,6–12,2). Les cas de VR sont de l'ethnicité Pacifique. Les fuites physiologiques étaient plus fréquentes chez les sujets du Pacifique (13,7%) que chez les sujets non-Pacifique (6,9% ; $p < 0,0001$). La VR était plus importante dans le groupe socio-économique le plus défavorisé. Aucun désaccord n'est survenu par les trois examinateurs concernant l'analyse du critère dynamique ; l'ensemble des désaccords étaient relatif aux critères morphologiques.

Conclusions. — La prévalence de la VR diagnostiquée échocardiographiquement est estimée chez l'adulte en Nouvelle Calédonie à 5,9 pour mille ; sont plus touchés les sujets d'ethnicité Pacifique et ceux à bas niveau socio-économique.

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Background

Rheumatic heart disease (RHD) is an important public health issue worldwide [1–4] and particularly in the Pacific region [5–9]. In many countries, school-based echocardiographic screening for RHD is being conducted [5,7–10]. These and other studies suggest that the prevalence of RHD increases steadily during the teenage years, peaking in young adults [11]. However, by not including older adolescents and young adults, school-based RHD screening programmes may underestimate the true burden of RHD in the population. Unfortunately, screening of adults is notoriously difficult, mainly because of low participation rates, but at least one study (in Nicaragua) has managed to screen for RHD in an adult population [10].

Echocardiography is a very sensitive tool for the screening of RHD, compared with cardiac auscultation [5,7,8]. The echocardiographical criteria required for the diagnosis of RHD have been debated [12,13], although the recent publication of the World Heart Federation criteria for echocardiographical diagnosis of RHD provides an evidence-based foundation for future research and practice [14]. The

diagnosis of RHD requires the presence of Doppler criteria confirming pathological valvular regurgitation, and a range of morphological criteria.

Morphological criteria can be separated into static criteria, analysed on frozen two-dimensional images (thickening and/or retraction of the valve leaflets and/or subvalvular apparatus), and dynamic criteria, assessed by frame-by-frame analysis (excessive or restricted mobility of valve leaflets). We hypothesized that any significant chordal and/or subvalvular mitral valve (MV) apparatus shortening or retraction should translate into a limitation of MV leaflet tip motion, which could be accurately and highly reproducibly assessed with a dynamic analysis of two-dimensional echocardiography images, focusing on the position of the MV leaflet tips with regard to the MV annulus plane throughout the cardiac cycle.

Since 2007, echocardiography has been used as a screening tool for RHD in 10-year-old school children in New Caledonia [15]. Although a list of criteria and recommendations for RHD diagnosis were established by the coordinator of the programme (Agence Sanitaire of New Caledonia), the final diagnosis of RHD is confirmed by the cardiologists

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