Acute rheumatic fever and rheumatic heart disease in Fiji: prospective surveillance, 2005–2008

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Source

Andrew C Steer, Joseph Kado, Adam W J Jenney, Michael Batzloff, Lepani Waqatakirewa, E Kim Mulholland and Jonathan R Carapetis, 2009 'Acute rheumatic fever and rheumatic heart disease in Fiji: prospective surveillance, 2005–2007, Medical Journal of Australia, vol 190, no. 3, pp 133-135, viewed 19 August 2015, https://www.mja.com.au/journal/2009/190/3/acute-rheumatic-fever-and-rheumatic-heart-disease-fiji-prospective-surveillance

Introduction

The following review is an attempt to critically analyses the article 'Acute rheumatic fever and rheumatic heart disease in Fiji: prospective surveillance, 2005–2007' first published in the Medical Journal of Australia in 2009. The article is by local Fijian authors and highly relevant as acute rheumatic fever (ARF) and rheumatic heart disease (RHD) contribute highly to the burden of disease in Fiji. The mentioned diseases also contribute greatly to admission numbers and mortality in third world countries like Fiji and are always regarded as areas of special interest as these diseases are virtually extinct in developed countries with NZ and Australia being exceptions. A thorough summary of the article will be provided and this will be followed by analysis of the article's structure with critique of how the information is set out and whether the findings are efficiently imparted to the interested reader. The review also sets to critique the content mainly with regards to accuracy, objectivity, general coverage and evaluation of its authority. It also explores the author credibility and their insights into the need for such a research. Overall, the topic was a well-chosen one and the article itself is well written, concise and extremely relevant.

Review of literature

Acute rheumatic fever (ARF) is an autoimmune, multi-system response secondary to molecular mimicry following Lancefield group streptococcus (GAS) pharyngitis; it is now most commonly found in the paediatric populations of developing nations. Within developed nations, the incidence of ARF and RHD has declined dramatically mainly due to improved living conditions, better access to health care and generally greater availability of penicillin based antibiotics. However, it should be noted that ARF and RHD are still highly prevalent in indigenous and migrant Pacific populations in developed countries like Australia and New Zealand. Despite the belief that it's been eradicated in developed countries, epidemiological data reveals 300,000 new cases globally and close to 15 million people with RHD globally. This has sparked renewed interest worldwide as to relook at epidemiology of ARF and RHD globally and in specific populations and making comparisons with regards to incidence, prevalence and general signs and symptoms. Fiji has similar incidence of the disease when compared to Aboriginal populations in Australia and Maori and Pacific Islander population in New Zealand. A number of epidemiological studies have been conducted in Fiji with majority trying to establish baseline figures and monitoring these indices over the years. The object of this review is to look at one of these studies and offer an insight to the methods and reasons behind it. Newer studies are using screening data from echocardiogram surveys and these are showing increased prevalence and incidence of ARF and RHD.

Article summary

The purpose of the study is to characterise the clinical epidemiology of patients admitted with ARF and RHD in Fiji. A number of similar studies have been conducted in developed countries especially during outbreaks or during discovery of endemic communities but not much data was available for low income countries like Fiji in the Pacific. There are also not many studies documenting the clinical presentation of these diseases in communities similar to Fiji and this study was also an attempt to document the main clinical features in all those admitted with ARF and RHD. This study will also be used to establish the burden of clinical disease and furthermore be used to develop potential clinical trials of Group A Streptococcal vaccines.

The study design used was a prospective surveillance study at CWM Hospital over a 23 month period. Case definitions in line with World Health Organisation standards were used and statistical analysis was done using national census figures. Major conclusions were that ARF remains a significant health problem in Fiji leading to premature morbidity and mortality and thus the urgent need for more effective control of ARF and prevention of RHD.

Article structure

The article is presented in a columnar format and visually appealing. The abstract is well highlighted and sets the tone for the remainder of the article. The abstract well defines the objectives, study design and setting with summary of results and well explained concluding statement. The introductory paragraphs of the article state the rationales for the research and how this research can be used further with regard to possible vaccine trials. The headings of the other paragraphs are vibrant and make it easy to navigate around the article. Paragraphs are also short and compact and generally avoid clustering of detailed information hence making the article easy to peruse. There are separate sections for abstract, introduction, method, results and discussion. Important data (the main findings of the study) has been tabulated and well placed within the article highlighting their significance. The findings and conclusions are stated under a singular heading of 'discussion' and the content is pretty comprehensive with regards to satisfying the aims of the study. References were also cited in-text and set out clearly in the literature cited section. The structure of the article is logically developed with the use of short paragraphs helping the reader access the main points easily. References are also clearly stated and it also has correspondence address of the principal author.

Article critique

Authority

The study has been conducted in Fiji and the article has been published in Medical Journal of Australia which is a peer reviewed journal and is the official journal of Australian Medical Association which is an objective unbiased public organisation. The journal is found on many academic databases and many articles are also open access and freely available online including the subject of this review.

The authors' credibility is established in a number of ways. All the lead authors are clearly stated with their qualifications and current place of work and positions held. The lead author is a research fellow and an academic working at Centre for International Child Health at University of Melbourne which itself is a highly credible organization. The study was also funded by US National Institutes of Health which again is a foremost medical research centre globally.

Accuracy

The source of all data is the prospective surveillance study that was conducted over 23 months from Dec 2005 to November 2007. The high number of authors aims to provide a well-designed study and the results generally state the same. The comprehensive lists of

reference text further corroborate with the data provided and are well cited in-text. The publishing entity has strict referring and peer review processes and all of these contribute to the articles exceptional accuracy.

Currency

The article was published in February 2009 while the study was received by MJA in May 2008 and accepted for publication in October 2008. The research was concluded nearly a yearly ago and the article cites up-to-date references in the body of the text. The article may be considered old as the review on it has been delayed by 6 years. The content matter (epidemiology of ARF and RHD in Fiji) however is highly current.

Relevance

This is an open access article published in a prestigious medical journal and has high credibility with regards to academic context. It was scripted after a comprehensive study over 23 months in a 3rd world country where the content matter (ARF and RHD) is highly relevant. The article serves multiple purposes in the sense it tries to establish baseline epidemiology and clinical presentation while also try to of relevance to future vaccine trial designs. It is not meant to advertise and nor there are any conflicting interests. Its authors are mainly academics and research specialists and the article is extremely relevant as it tries to do a study where not many studies on the same topic have been done previously.

Objectivity

The data has been presented objectively showing the full research that was conducted. It is very supported with numerous references and data fits in similar research done elsewhere. There is no evidence of bias which again highlights the rigorous and lengthy research process conducted by a number of qualified people. Ethical considerations were met and necessary approvals received were also stated in the research. The research attempted to ascertain epidemiology of ARF and RHD in a low income country and all the objectives were well met. Conclusions were in line with similar research done in other communities and all are well referenced.

Stability

Research conducted has been published as a journal article by Medical Journal of Australia. It can be recovered from numerous online academic databases and is therefore stable as a resource.

Analysis of graph

There has been graphical representation of data via tables. All the tables are well presented and data is easy to assimilate from them. Table 1 makes comparisons against demographic features of patients presenting with definite acute rheumatic fever to CWM Hospital from December 2005 to November 2007. Table 2 shows the clinical features of patients with ARF who were enrolled in the study in the above mentioned timeline. Table 3 presents similar data as Table 2 but the case definition of RHD is used. The data that the team set out to assimilate is well displayed in the tabular form and makes it easy to interpret and shows the objectives of the research were met easily.

Recent advances related to the topic

The research conducted by the esteemed writers aim to establish baseline epidemiology of ARF and RHD in Fiji. It also stated the main clinical features of patients who were admitted with either ARF or RHD over a 23 month from 2005 to 2007. Similar research has been conducted in other Pacific Island countries like Samoa and similar conclusions have been presented. Another study from Samoa has demonstrated the effectiveness of Rheumatic Fever Programme in Samoa in decreasing the incidences of ARF and RHD over the years. The same

study also makes recommendations that RHD screening with echocardiogram in schools may be the best way to reduce the burden and suffering from RHD.

Newer studies have also tried to relook at the etiology and pathogenesis of ARF again using more detailed biochemical analysis. Cunningham, 2012 reinforced the role of Streptococcus and molecular mimicry and eventual antibody binding to cell surface antigens leading to valve damage in RHD or neuropsychiatric behaviours in Sydneham chorea.

Marijon et al, 2013 mentioned in her Lancet article that early detection and targeted treatment of RHD might be possible if populations at risk for RHD in endemic areas are screened. In this setting, active surveillance with echocardiography-based screening might become very important. Newer studies are using echocardiogram in their case definitions to give a better account of the incidence of ARF and RHD.

A comprehensive review article by Krishna published in 2013 gave an account of the developing epidemiological trends of ARF and RHD over the last 50 years. The key conclusions continue to be that ARF and RHD are an undesirable burden as it results in mortality and mortality for young adults. There is also mention of primary prevention but it's only possible with development of a suitable vaccine designed to prevent GAS infection related supportive and non-supportive clinical manifestations.

Heningham, 2013 states there is no commercial GAS vaccine available and that development of such a vaccine remains an elusive process as researchers are confronted with many obstacles mainly in the form of more than 150 serotypes. The research is also complicated by lack of animal model trials as GAS is an exclusive human pathogen.

Conclusion

Steer et al, 2009, attempts to define epidemiology of ARF and RHD in Fiji by doing a prospective surveillance of cases admitted to CWM Hospital over a 23 month period from 2005 to 2007. The authors also investigate the main clinical features of ARF and RHD amongst those meeting case definition. The research was submitted to Medical Journal of Australia and duly published in October 2008. The content, structure, strengths and limitations of the article were analysed and critiqued. The study objectives were met and well presented on the article in tabular form. The abstract is well written as it describes the research and states the conclusions which is highly in line with similar research done all over the world. The article is exemplary as it adds to the growing literature on ARF and RHD and gives a standard for newer research and future collaborative possibilities such as vaccine trials.

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