

Short Report

Education: The prevention of acute rheumatic fever and rheumatic heart disease in Malawi

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Abstract

Background

With an estimated prevalence of 183,200 cases, rheumatic heart disease (RHD) is a major public health problem in Malawi. However, patients in Malawi with advanced RHD are left with substantial and life-threatening disability because there are no surgical options available in our country at present. In order to tackle this epidemic, it is critical to provide appropriate education and attempt to diagnose the disease earlier. In this study, we aimed to pilot a RHD education program that could be subsequently adopted country-wide.

Methods

We designed and piloted a RHD educational program targeting health providers at Kamuzu Central Hospital in Lilongwe, Malawi. This involved three half-day workshops. These workshops were facilitated by a paediatric cardiologist and a paediatric nurse. Tests were administered before and after the workshops; we also provided questionnaires and requested feedback evaluations. A total of sixty-five participants (51 nurses, 3 doctors, 9 clinical officers and 2 unspecified personnel) participated in our workshops.

Results

Concerns were voiced and addressed relating to the safety of benzathine penicillin. Post-workshop questionnaires revealed that participants were much more comfortable prescribing or injecting benzathine penicillin after the workshop, as indicated by an improvement in the comfort level from 2.8 to 4.5 in nurses, and from 3.4 to 5 in clinicians (using a Likert scale of 1 to 5, $p < 0.01$). Pre-test knowledge scores improved from 43.8% to 78.5% ($p < 0.01$). Overall, the workshops received good feedback with an overall rating of 4.8 out of 5 ($n=61$, range 3–5).

Conclusion

Our analysis showed that practical sessions relating to acute rheumatic fever and RHD in Malawi must address the safety and administration of penicillin. Our pilot workshops could serve as the educational backbone for a national RHD prevention program in Malawi.

Key Words

Rheumatic heart disease, paediatrics, education, paediatric cardiology, acute rheumatic fever, Malawi

Introduction

Rheumatic heart disease (RHD) is a major public health problem in Malawi. Currently, there are an estimated 183,200 prevalent cases of RHD nationally with 39 million cases globally¹. RHD is the leading cause of cardiac death in young people worldwide¹. Unfortunately, most children in Malawi present with RHD at a late stage and are already suffering from severe damage to the heart valves². If diagnosed earlier, such instances of advanced disease can be prevented. The first step in preventing advanced disease is improving the efficiency of detection. There is currently no ARF and RHD education program in place. We believe that educating health personnel through workshops is a step towards improving the early detection of acute rheumatic fever (ARF) and RHD. Knowledge relating to benzathine penicillin, and potential allergies, is also very important in ensuring that this drug is administered safely and to avoid misconceptions among nurses. Our objective was to design and pilot a RHD educational program which we hope will serve as the educational backbone of a future RHD prevention program backed by the Ministry of Health in Malawi.

Materials and methods

We designed an ARF and RHD education curriculum (Table 1) which included dedicated sessions on RHD modules (available online, designed by Wired international), benzathine penicillin (safety and allergy), and ARF and RHD in Malawi.

Table 1: Workshop themes

Workshop themes:
1. Strep throat, rheumatic fever and rheumatic heart disease diagnosis and treatment
2. Complications associated with rheumatic heart disease
3. Benzathine penicillin: importance, administration, safety and allergy
4. Acute rheumatic fever and rheumatic heart disease in Malawi

Three half-day workshops were conducted in one week. Participants attended one session each. Participants were affiliated to Kamuzu Central Hospital (KCH) and/or Baylor-Malawi. We invited all paediatric clinicians and nurses to participate. The workshops took place on the grounds of KCH and Baylor-Malawi Clinic in Lilongwe, Malawi. The workshop was facilitated by a paediatric cardiologist

and a paediatric nurse. Multiple choice and fill in the blank tests were carried out before and after the workshops. We also administered questionnaires and asked for feedback evaluations. A Likert scale of 1 to 5 was used, with 1 being 'not comfortable,' and 5 being 'very comfortable.' T-tests were used to test for significance. A total of sixty-five participants (51 nurses, 3 doctors, 9 clinical officers, and 2 unspecified personnel) attended the training sessions.

Results

The mean score in the pre-workshop tests relating to the knowledge of ARF and RHD was 5.7 out of 13 (+/-2, 43.8%; range: 2–11). The mean score in the post-workshop test was significantly higher ($P < 0.01$) at 10.2 out of 13 (+/-2.2, 78.5%; range: 5–13). Using a Likert scale of 1 to 5, with 1 being 'not comfortable,' and 5 being 'very comfortable,' the mean pre-workshop comfort level for nurses injecting penicillin was 2.8 ($n=49$; range: 1–5); the mean post-workshop comfort level was significantly higher ($P < 0.01$) at 4.5 ($n=48$; range: 1–5). The mean comfort level of clinicians with regards to prescribing benzathine penicillin was 3.4 in the pre-workshop test ($n=11$; range 1–5) but was significantly higher at 5.0 after the workshop ($n=11$; $P < 0.01$; range 5-5).

Our pre-workshop questionnaires noted a major concern among nurses with regards to the safety of benzathine penicillin. Concerns relating to the use of giving benzathine penicillin, which were reported on the questionnaires, included 'history of death after an injection,' and 'many clients go into cardiac arrest so many nurses are afraid to give injections.' All workshops included a session addressing the importance of safety and an awareness of allergy with regards to the use of penicillin. Each session included an open discussion in which concerns could be voiced and addressed by any of the participants. Overall, the workshops received good feedback with an overall mean rating of 4.8 out of 5 ($n=61$, range 3–5). Questionnaires and feedback forms are available upon request.

Discussion

Benzathine penicillin is the mainstay in the prevention and treatment of RHD and has been shown to reduce mortality and improve outcomes³. However, based on our pretest questionnaires, we found that although there are proven and well known benefits to the use of benzathine penicillin, many nurses are reluctant to administer this drug. Consequently, we particularly wanted to include nurses as participants in our newly designed workshops. No previous studies have targeted the general knowledge of healthcare workers with regards to ARF and RHD as a prevention strategy. ARF and RHD education is often directed to the patients themselves in order to encourage health-seeking behaviour for sore throats. We strongly felt that it is also very important to strengthen the knowledge base of healthcare workers with respect to ARF and RHD as part of a comprehensive RHD prevention strategy. Other studies have shown that nurse-led interventions can help to control RHD. The first step in empowering a health care team to take on such tasks is the acquisition of knowledge⁴. If the outcomes of RHD are to be improved in Malawi, it is very important that continued education must be provided which focuses upon ARF, RHD and benzathine penicillin.

One limitation of our study is the level at which we evaluated the knowledge of our participants. We acknowledge that imparting knowledge does not by itself automatically

translate into practice. According to Miller's pyramid, we evaluated our participants at the knowledge level, which forms the lowest section of the pyramid⁵. In subsequent workshops, we will attempt to systematically evaluate our participants at a higher level to determine if their practice has changed. Other barriers to penicillin, such as availability and patient access, were not evaluated in this study but are currently under evaluation.

Conclusion

We suggest that any educational session on rheumatic heart disease in Malawi must address the safety and administration of penicillin. By clinical practice, we were aware that nurses were not comfortable giving benzathine penicillin; therefore we created a curriculum for our workshops which highlighted the importance, safety and potential allergic risk of benzathine penicillin. We plan for more intensive workshops to be created from our pilot studies to serve as a platform for the educational component of a future RHD control program in Malawi.

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Author contributions

AS: Project design, funding acquisition, curriculum development, facilitating workshops, data analysis, manuscript writing, critical editing and approval.

PC: Project design, curriculum development, facilitating workshops, manuscript critical editing and approval.

MC: Project design, manuscript critical editing and approval.

Competing interests

The authors have no conflicts of interest to disclose.

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