WHO programme for the prevention of rheumatic fever/rheumatic heart disease in 16 developing countries: report from Phase I (1986–90)

WHO Cardiovascular Diseases Unit and principal investigators

The programme was initiated in 1984 by WHO in close collaboration with the International Society and Federation of Cardiology (ISFC). Sixteen countries in five WHO Regions participated: Mali, Zambia and Zimbabwe (in Africa); Bolivia, El Salvador and Jamaica (in the Americas); Egypt, Iraq, Pakistan and Sudan (in the Eastern Mediterranean); India, Sri Lanka and Thailand (in South-East Asia); and China, the Philippines and Tonga (in the Western Pacific). The programme was planned for implementation in three phases: pilot study and control programme in a selected area, control programmes in all the selected communities, and their extension to the whole country.

In Phase I, a total of 1,433,710 schoolchildren were screened and 3,135 cases of rheumatic fever/rheumatic heart disease (RF/RHD) were found, giving a prevalence of 2.2 per 1000 (higher in the African and Eastern Mediterranean regions); 33,651 recently identified or already known cases were registered; completion of secondary prophylaxis was irregular but averaged 63.2% coverage; percentages of adverse reactions (0.3%) and recurrence of acute RF (0.4%) were very small; 24,398 health personnel and teachers were trained. Health education activities were organized for patients, their relatives, and the general public in hundreds of health education sessions. Thousands of pamphlets, brochures and posters were distributed, and health education programmes were broadcast on radio and television. The quality of care for RF/RHD patients improved under the programme, which has been expanded to other areas.

Introduction

Rheumatic fever/rheumatic heart disease (RF/RHD) is the most common cardiovascular disease in children and young adults and remains a major public health problem in developing countries (1). The cost is very high because of repeated hospitalizations (often resulting in premature death), the enormous resources needed for medical and surgical treatment of large numbers of patients, and the suffering caused to patients and relatives (2). The resurgence of acute RF in the USA in the mid-1980s, with its specific epidemiological characteristics, plus other isolated epidemics of RF (1, 2), and the absence of an effective antirheumatic streptococcal vaccine or genetic marker to identify people at high risk of developing RF, point to the fact that intensified research is needed in these areas. Meanwhile, the available and feasible preventive methods must be applied (1, 2).

WHO has been concerned with RF/RHD prevention and control since 1954, when the WHO Expert Committee on Rheumatic Diseases suggested...
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the possibility of using antibiotics and sulfonamides to prevent RF/RHD on a worldwide scale (3). Subsequently, other WHO Expert Committees have directed their efforts towards public health practices with regard to the study, prevention and control of group A streptococcal infections and RF/RHD (1, 3–8), a, c.

In the 1970s, WHO initiated an international cooperative study on RF/RHD prevention in seven developing countries in Africa, the Americas and Asia, and the Pan American Health Organization (PAHO) developed another study in seven Latin American countries. Both of these demonstrated that community programmes for the secondary prevention of RF/RHD were not only feasible but also cost-effective in developing countries (9), and this has been stressed in several WHO reports on RF/RHD (1, 6–10), b, c, d.

In 1984, in response to a World Health Assembly resolution (WHA36.32), WHO, in close collaboration with the International Society and Federation of Cardiology (ISFC), initiated the global programme for the prevention of RF/RHD in 16 developing countries. This programme, which was designed to encourage the application of proven control measures to decrease morbidity and mortality due to RF/RHD and to support national strategies for Health for All by the Year 2000, is partly funded by the Arab Gulf Programme for United Nations Development Organizations (AGFUND).

Methods

Based on the experiences from the earlier WHO cooperative research study (9), the present programme was conceived and planned as a service-oriented activity to be implemented through primary health care (PHC) and the national health care delivery system. The Ministry of Health therefore has executive responsibility for the national programme, appointing the national programme manager and a multidisciplinary advisory committee, and providing local inputs to maintain the programme at a viable level.

Each collaborating country has national plan of operation following guidelines provided by WHO, with objectives and targets and commitment to extend programme activities in respective steps towards nationwide coverage. Each country plan of operation was signed by the Ministry of Health and the respective WHO Regional Director to indicate their endorsement of the collaboration with WHO.

The programme’s implementation phases:

- short-term (Phase I): planning and pre-programme pilot study, and programmes control in the selected area;
- medium-term (Phase II): community consultation (consolidation and extension to the whole school community);
- long-term (Phase III): nationwide consultation (consolidation and extension to the whole community).

Collaborating countries. Sixteen WHO Regions were identified in 1984 and have been participating in the global programme:

- Africa (population, 193,615): Malawi, Tanzania, Zimbabwe
- The Americas (140,700): Bolivia, El Salvador, Jamaica
- Eastern Mediterranean (874,813): Egypt, Turkey, Pakistan, Sudan
- South-East Asia (1,950,000): India, Sri Lanka, Thailand
- Western Pacific (632,000): China (Guangdong Province), Philippines, Tonga.

Programme approaches. Three cover case-finding, registration, and secondary prophylaxis.

Three approaches are used for case-finding: (1) screening surveys of schoolchildren (2) hospital retrospective case surveys; and (3) continuing collection and referral of suspected case from hospital discharge, outpatient services or any other sources.

A central register was created to record all names and main data of all confirmed RF/RHD patients. In some areas, there is a referral centre for confirmation of the suspected patients.

Follow-up consultation and laxis are conducted in the local...
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Prevalence of RF/RHD, by Region

<table>
<thead>
<tr>
<th>Region</th>
<th>No. of surveys</th>
<th>No. of schoolchildren screened</th>
<th>No. of RF/RHD cases detected</th>
<th>Prevalence per 1000 (range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHO European</td>
<td>11</td>
<td>173,408</td>
<td>818</td>
<td>4.7 (3.4-12.6)</td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
<td></td>
<td>1.5 (0.4-7.9)</td>
</tr>
<tr>
<td>WHO African</td>
<td>5</td>
<td>23,328</td>
<td>35</td>
<td>4.4 (0.9-10.2)</td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
<td></td>
<td>0.12 (0.1-1.3)</td>
</tr>
<tr>
<td>WHO Eastern Mediterranean</td>
<td>19</td>
<td>403,253</td>
<td>1,670</td>
<td>0.7 (0.6-1.4)</td>
</tr>
<tr>
<td>WHO South East Asia</td>
<td>6</td>
<td>165,142</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>WHO Southeast Asia</td>
<td>17</td>
<td>631,839</td>
<td>449</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>58</td>
<td>1,433,710</td>
<td>3,125</td>
<td>2.2 (0.7-4.7)</td>
</tr>
</tbody>
</table>

Personnel training and health education. Health education was carried out by all collaborating countries as an integral part of the programme. This included training for school teachers and health personnel (including doctors) to carry out education of healthy children, parents and their families, and the general public. The health education message was disseminated by the use of pamphlets, brochures and posters and regular television/radio sessions or newspaper articles. These activities were conducted by doctors, nurses and other trained personnel, under the responsibility of the programme manager and the programme advisory committee.

Evaluation procedure. Continuous evaluation was maintained throughout the programme, and a six-monthly progress report was submitted to WHO from 11 centres between May 1986 and March 1990. Occasionally reports were not received from some centres or were delayed.

Case-finding, registration and secondary prophylaxis.

A total of 1,433,710 schoolchildren were screened through 58 surveys carried out in the selected area of the collaborating countries. 3135 cases of RF/RHD were found, giving an average prevalence rate of 2.2 per 1000 (range, between 0.1 and 12.6), which was higher in the African and Eastern Mediterranean regions (4.7 and 4.4/1000) (Table 1). The countries with the highest prevalence rates were Zambia (12.6), Sudan (10.2), Bolivia (7.9) and Egypt (5.1).

During the study period, 33,851 recently identified cases or already known cases were registered: 8899 from hospital retrospective surveys and other sources (including 3135 through screening), and 24,762 known cases (Table 2). The percentage of recently identified cases was higher in the Eastern Mediterranean (81.0%).

Secondary prophylaxis was administered to more than 30,000 registered patients, at first to 4304 in the pre-programme pilot study and then, depending on the survey reports, to newly registered cases; patients who had completed their course of prophylaxis or had died or moved elsewhere were excluded. An average of 12,000 patient-years was registered for prophylaxis.

The rate of coverage per 100 patients registered for secondary prophylaxis per month, although irregular, averaged 61.2% (range, 23.8-96.9%); coverage was higher in the Western Pacific and lower in the Americas and Eastern Mediterranean (Table 3). The countries with the lowest rates were El Salvador (23.8%), Mali (31.8%) and Egypt (39.4%). The expected coverage rate of

* See footnote d on page 214.

The results are based on the pre-programme pilot study report from the sixteen collaborating countries and the six-monthly progress reports submitted to WHO from 14 centres between May 1986 and March 1990. Occasionally reports were not received from some centres or were delayed.
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<table>
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<th>Table 3: Case detection and registration, by Region</th>
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<td>WHO Region</td>
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</tr>
<tr>
<td>Africa</td>
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<td>Americas</td>
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<td>Eastern Mediterranean</td>
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<td>South-East Asia</td>
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<td>Western Pacific</td>
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<tr>
<td>All Regions</td>
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> 70% was reached by 9 of the 14 countries. Benzathine benzylpenicillin by injection was administered to 95.7% of the patients; adverse reactions were reported by 36 patients (0.3 per 100 patient-years), or 8 per 10,000 injections administered during the programme, including 11 cases of severe anaphylaxis (0.09% patient-years, or 2 per 10,000 injections), of whom 4 died (0.03% patient-years, or 0.8 per 10,000 injections). Pain and local reactions were reported in the area of injection. Recurrence of RF occurred in 36 patients (0.4 per 100 patient-years), of whom only two were receiving regular penicillin prophylaxis (3.8% of the recurrence and 0.02 per 100 patient-years). Those not included in the coverage data had dropped out or were irregular in completing the year's course of prophylaxis, which occurred more frequently with oral prophylaxis (Table 3).

Personnel training and health education

Training of doctors, nurses, other health personnel, and teachers to carry out health education or other technical aspects of the programme was conducted on a total of 24,398 persons. This was developed several workshops, seminars, symposia, and education courses. Health education activities in patients, relatives, healthy children and the general public were supported by 1032 health education group sessions; and thousands of pamphlets, brochures and posters were distributed in schools and health centres. Also, a total of 124 radio or television programmes were broadcast. They were conducted in the 14 participating countries, and adapted to local conditions and specific cultural and linguistic characteristics (Tables 4 and 5).

Discussion

The observed prevalence rate of RFRHD was lower than expected, which may be because it showed only in some selected schools. The large number of recenty identified patients and already known cases indicates that RF/RHD remains an important problem for children, adolescents and young adults in almost all the participating countries, and that all the case finding approaches used in the programme were useful.

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<th>Table 4: Training of personnel, by type and Region</th>
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<td>WHO Region</td>
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<tr>
<td>Africa</td>
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<td>Americas</td>
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<td>South-East Asia</td>
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<tr>
<td>Western Pacific</td>
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<tr>
<td>Total</td>
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<th>Table 5: Activities for health education, by Region</th>
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<td>WHO Region</td>
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<td>Africa</td>
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<td>South-East Asia</td>
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<td>Western Pacific</td>
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<td>Total</td>
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Global programme for preventing rheumatic fever/rheumatic heart disease

Résumé

Programme OMS de prévention du rhumatisme articulaire aigu et des cardiopathies rhumatismales dans 16 pays en développement: rapport de la Phase I (1986–1990)

Le programme a été lancé en 1984 par l'OMS en collaboration étroite avec la Société et Fédération internationale de Cardiologie (SFIC). Seize pays appartenant à cinq Régions OMS y participent: Mali, Zambie et Zimbabwe (Afrique); Bolivie, El Salvador et Jamaïque (Amériques); Egypte, Iraq, Pakistan et Soudan (Méditerranée orientale); Inde, Sri Lanka et Thaïlande (Asie du Sud-Est); Chine, Philippines et Tonga (Pacifique occidental). Le programme devait être mis en œuvre en trois phases: étude pilote et programme de lutte dans une région choisie, programmes de lutte dans toutes les communautés choisies, extension à l'ensemble du pays.

Au cours de la Phase I, un total de 1 411 910 écoliers ont été dépistés et 3135 cas de rhumatisme articulaire aigu ou de cardiopathie rhumatismales ont été trouvés, ce qui correspond à une prévalence de 2,2 cas pour 1000 (avec des chiffres plus élevés dans la Région africaine et la Région de la Méditerranée orientale); 33 651 cas recemment diagnostiques ou déjà connus ont été enregistrés; la prophylaxie secondaire a été irrégulièrement suivie, mais a atteint une couverture de 63,2%; les pourcentages de réactions indésirables (0,3%) et de rechutes de rhumatisme articulaire aigu (0,4%) ont été très faibles; 24 398 membres des personnels de santé et enseignants ont été formés. Des activités d'éducation pour la santé ont été organisées à l'intention des malades, des familles et du grand public, au cours de centaines de séances éducatives. Des milliers de brochures et d'affiches ont été distribuées, et des programmes d'éducation pour la santé ont été diffusés à la radio et à la télévision. La qualité des soins aux malades atteints de rhumatisme articulaire aigu et de cardiopathies rhumatismales s'est améliorée au cours du programme, qui a été étendu à d'autres régions.

References

WHO and principal investigators


Annex

Programme sites and principal investigators

African Region
Mali: Hôpital du point “G”, Ecole Nationale de Médecine et de Pharmacie, Bamako (M.K. Toure).
Zambia: University Teaching Hospital, Medical School, Lusaka (K. Mukelabi).
Zimbabwe: Department of Medicine, University of Zimbabwe, Harare (J.A. Matenga).

American Region
Bolivia: Instituto Nacional del Torax, La Paz (J. Jauregui-Tapia assisted by E. Imana, V.H. Loaiza, M. Herrera).
El Salvador: Department of Medicine, Hospital, San Salvador (J.J. Fernandez assisted by L. Rivera de Cepeda, L. Urrutia & E. Maza).
Jamaica: Child Health Department, University of West Indies, Kingston (D. Millard).

Eastern Mediterranean Region
Egypt: Department of School Health, Ministry of Health, Cairo (A.M.A. Hafez).
Iraq: Medical City Children’s Hospital, Baghdad (Al Awqati & A.H. Al-Khazraji).
Pakistan: Department of Medicine, Pakistan Institute of Medical Sciences, Islamabad (A.H. Abbasi assisted by S. Aziz, G. Alam, A. Khan, M.I. Khan, A.Q. Khan).
Sudan: Department of Cardiology, Shargiya Hospital, Khartoum (S.I. Khalil).

South-East Asian Region
India: Ministry of Health & Family Welfare, Postgraduate Institute of Medical Education and Research, Chandigarh (P.L. Wahi assisted by A. Grover, S. Iyengar, K.N. Ganguly, R. Kumar & S. Kumar).
Sri Lanka: Department of Cardiology, General Hospital, Colombo (N. Thambiah).
Thailand: Department of Medical Services, Ministry of Public Health, Bangkok (S. Phialakornkule assisted by P. Pintulbut).

Western Pacific Region
China: Guangdong Cardiovascular Institute, Guangzhou (Lo Zhengxiang assisted by Zhen-Dong Jiang, Xu-Xu Rao, Hui-Min He, Run-Chao Cen & Ge-Ming Ni).
Philippines: Preventive Cardiology Department, Philippine Heart Centre, Manila (S.V. Guzman assisted by M.C.O. Claridad, P.U. Ortega, M.A. Paraz & E. Manrique).
Tonga: Health Division, Ministry of Health, Nuku’alofa (S. Foliaki).

Mortality population
D.C. Minassian

The study was carried out in persons aged 10 and over in 102,602 males and females in 1985–1986 as in the study sample.

No association between cardiovascular mortality and diabetes among diabetics (conflicting results: cardiac surgery (2-study of a random central India and 9-study of a random specific cases). The concordant mortality and the interaction between discussed.

Methods
A collaborative in 1982 in the Raipur baseline data were...