

From research to practice: the example of antenatal care in Thailand

Pisake Lumbiganon,¹ Narong Winiyakul,² Chompilas Chongsomchai,³ & Kamron Chaisiri⁴

Abstract The rationale for providing antenatal care is to screen predominantly healthy pregnant women to detect early signs of, or risk factors for, abnormal conditions or diseases and to follow this detection with effective and timely intervention. The recommended antenatal care programme in most developing countries is often the same as the programmes used in developed countries. However, in developing countries there is wide variation in the proportion of women who receive antenatal care. The WHO randomized trial of antenatal care and the WHO systematic review indicated that a model of care that provided fewer antenatal visits could be introduced into clinical practice without causing adverse consequences to the woman or the fetus. This new model of antenatal care is being implemented in Thailand. Action has been required at all levels of the health-care system, from consumers through to health professionals, the Ministry of Public Health and international organizations. The Thai experience is a good example of moving research findings into practice, and it should be replicated elsewhere to effectively manage other health problems.

Keywords Prenatal care/organization and administration; National health programs/organization and administration; Randomized controlled trials; Meta-analysis; World Health Organization; Evidence-based medicine; Thailand (*source: MeSH, NLM*).

Mots clés Soins prénataux/organisation et administration; Programme national santé/organisation et administration; Essai clinique randomisé; Méta-analyse; Organisation mondiale de la Santé; Médecine factuelle; Thaïlande (*source: MeSH, INSERM*).

Palabras clave Atención prenatal/organización y administración; Programas nacionales de salud/organización y administración; Ensayos controlados aleatorios; Meta-análisis; Organización Mundial de la Salud; Medicina basada en evidencia; Tailandia (*fuentes: DeCS, BIREME*).

الكلمات المفتاحية: الرعاية السابقة للولادة، تنظيم وإدارة الرعاية السابقة للولادة؛ البرامج الصحية الوطنية، تنظيم وإدارة البرامج الصحية الوطنية؛ التجارب المعشاة المضبوطة بالشواهد؛ التحليل التلوي؛ منظمة الصحة العالمية؛ الطب المسند بالبيانات؛ تايلاند (المصدر: رؤوس الموضوعات الطبية المكتب الإقليمي لشرق المتوسط)

Bulletin of the World Health Organization 2004;82:746-749.

Voir page 748 le résumé en français. En la página 748 figura un resumen en español.

يمكن الاطلاع على الملخص بالعربية في صفحة 748.

What is antenatal care?

In theory, antenatal care reduces maternal and perinatal morbidity and mortality directly through the detection and treatment of pregnancy-related or intercurrent illness or indirectly through the detection of women at increased risk of complications of delivery by ensuring that they are cared for in a suitably equipped facility (1). The basic content of care at each visit has not changed substantially over the years, although modern technology has led to the introduction of several new elements in pregnancy surveillance (2).

As maternal and perinatal outcomes improved dramatically in the developed world, antenatal care was given much of the credit despite a lack of evidence for its precise benefits (3). In countries where women usually attend antenatal services early in pregnancy, the average number of visits is 10–12, and attendance rates are nearly 100% (4). Recently, trials have indicated that reducing the number of antenatal visits does not affect overall outcome (5–8).

In developing countries, where 80% of the world's women live, the process of pregnancy and childbirth is still sometimes

quite dangerous (9). The recommended programmes of antenatal care in most developing countries are often similar to those used in developed countries. However, departure from the standard programme is almost always the rule, usually the result of insufficient resources or women's lack of attendance (10). Surveys from a number of developing countries done between 1980 and 1989 revealed that coverage of antenatal care ranged from 50% to 90% (11).

Evidence supporting the effectiveness of antenatal care

Questions about the effectiveness of antenatal care were initially raised by Archie Cochrane in 1972. He wrote: "By some curious chance, antenatal care has escaped the critical assessment to which most screening procedures have been subjected" (12). Before the WHO antenatal care trial was conducted, there had been attempts to evaluate antenatal care programmes for low-risk women. Fiscella found that the absence of direct, randomized controlled trials precluded a straightforward evaluation of

¹ Professor, Department of Obstetrics and Gynaecology, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand, 40002 (email: pisake@kku.ac.th). Correspondence should be sent to this author.

² Medical Officer, Health Promotion Centre, Region 6, Khon Kaen, Thailand.

³ Assistant Professor, Department of Obstetrics and Gynaecology, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand.

⁴ Chief Medical Officer, Nong Khai Provincial Health Office, Nong Khai, Thailand.

Ref. No. 03-004176

(Submitted: 15 December 2003 – Final revised version received: 24 June 2004 – Accepted: 24 June 2004)

the impact of prenatal care on birth outcomes (13). Another extensive review of the literature found that “carefully controlled evaluations of the content, number and timing of prenatal care visits for women with differing medical and social risks are essential” (14).

WHO antenatal care trial and research synthesis

The Department of Reproductive Health and Research at WHO conducted a multicentre cluster–randomized controlled trial to evaluate routine antenatal care in developing countries (15). A total of 53 antenatal care clinics in Argentina, Cuba, Saudi Arabia and Thailand were randomly assigned to provide either the new WHO model of care or the standard model used in that country. Altogether, 27 clinics were assigned to use the new model and 26 clinics to use the standard model. In total, 24 678 women were enrolled over an 18-month period between 1996 and 1998. Women attending the clinics that had been randomly assigned to use the new model had a median of five visits; those visiting clinics providing standard care had a median of eight visits. The trial found that providing routine antenatal care using the new model produced similar maternal and perinatal outcomes to the standard model. Women and providers seemed to accept the new model, and it was found that implementation may reduce the costs of antenatal care (15).

A systematic review of randomized controlled trials evaluating the effectiveness of different models of antenatal care was published by WHO in 2001 (16, 17). There was no difference between the two models with respect to the incidence of pre-eclampsia, urinary-tract infections, postpartum anaemia and maternal mortality. The two models were also similar in terms of the incidence of children born at low birth weight and perinatal mortality. Some women in the studies, especially those in developed countries, expressed dissatisfaction with the reduced number of antenatal visits. The new model, under which women had fewer antenatal visits, cost the same or less than the standard model.

Based on these results and the results of the randomized trial of antenatal care, it was concluded that models with fewer antenatal visits could be introduced into clinical practice in both developed and developing countries without any risk of adverse consequences to the woman or fetus. WHO has since published *The WHO antenatal care randomized trial: manual for the implementation of the new model* and distributed it worldwide (18).

Implementing the new model for antenatal care in Thailand

There are often unacceptable delays in implementing research findings. This results in inappropriate care for patients (19). Three basic issues influence the uptake of research evidence: the attributes of the evidence, barriers and facilitators to changing practices, and the effectiveness of dissemination and implementation strategies (20). Evidence on the effectiveness of using specific interventions to promote change is incomplete, but a combination of interventions is often needed (21). It is possible to change the behaviour of health-care providers but this change generally requires the use of comprehensive approaches that are tailored to specific settings and target groups (20). Passive dissemination is generally ineffective (22). Researchers

need to design studies that take into account how and by whom the results will be used (23), and they must also be aware of the need to convince decision-makers to use the intervention (23).

As participants in the WHO antenatal care trial we were cognizant of the difficulties of bringing research into practice, so we developed an implementation plan for the new antenatal care model in Thailand before the trial started. At the central level, we informed authorities in the Ministry of Public Health, including the Director of the Division of Health Promotion and the Director-General of the Department of Health, about the trial. They were interested in the trial and eager to be kept informed about its progress and the results. We obtained ethical approval from the Ethics Committee of the Ministry of Public Health. At the local level, we obtained permission to conduct the study from the Director of the Regional Health Promotion Centre and the Provincial Chief Medical Officer. We also obtained ethical approval from the Ethics Committee of Khon Kaen University.

There are four broad principles of a truly cooperative research partnership: mutual trust and shared decision-making, national ownership, an emphasis on bringing research findings into policy and practice, and the need to develop national research capacity (24). To try to build this type of partnership, we invited medical officers from the Regional Health Promotion Centre and the Provincial Health Office to participate as co-investigators. We created a sense of ownership for the medical officers by including them on the team from the beginning. We strongly believed that this would be one of the crucial steps in getting the research results implemented. The overall WHO antenatal care trial involved people from many organizations (for example, universities, health promotion centres, provincial health offices and district hospitals) and thus helped build research capacity in the countries taking part.

Disseminating the findings of the WHO systematic review to policy-makers, health professionals and consumers was seen as an essential prerequisite to changing practices (25). This is because action is required at all levels of health-care systems, from consumers through to health professionals, ministries of health and international organizations (25). Therefore, the other important step in implementation was translating the WHO manual into Thai to overcome the language barrier. We presented a translated version of the manual together with copies of the two papers from the *Lancet* (16, 17) to obtain approval from the relevant public bodies to implement the new antenatal care model in Thailand. We also obtained official permission to implement the new model in Khon Kaen Province from the Governor, the Maternal and Child Health Board and the Administrative Committee for Health Care of the Province.

Once we had obtained approval, we conducted four workshops for 155 health personnel from the 24 Ministry of Public Health hospitals in Khon Kaen Province. We presented participants with the concepts and details of the steps in the new model. We organized a press conference, which was chaired by the Provincial Chief Medical Officer, to inform the media about the rationale behind the model and the implementation of it. We also made two site visits to each hospital to supervise and answer any questions that health personnel might have during implementation.

As of May 2004, the new model had been implemented in all 24 hospitals in Khon Kaen Province that had been included in the workshops. There were some minor problems during the early phase of implementation. These included the

fact that some providers did not want to change from a familiar practice to an unfamiliar one; some providers were not comfortable or did not have enough skills to manage some of the procedures (for example, nurses were not comfortable doing routine pelvic examinations and doctors did not know how to perform external cephalic version); some hospital directors did not want to invest in procedures that they thought were not cost-effective (for example, Rh screening and urine dipsticks); some providers did not follow the recommended steps strictly (for example, the use of classifying forms and checklists); some women were concerned about the long intervals between visits, particularly women who had been pregnant before and who

were familiar with having shorter intervals. However, most of these problems were detected, clarified and resolved during the site visits. ■

Acknowledgements

The authors would like to thank Professor Nikorn Dusitsin who kindly helped us to become involved with WHO and Dr Olav Meirik and Dr Jose Villar who kindly gave us the opportunity to participate in the WHO antenatal care trial.

Conflicts of interest: none declared.

Résumé

De la recherche à la pratique : l'exemple des soins anténataux en Thaïlande

Pour justifier l'apport de soins anténataux, on avance la nécessité de soumettre les femmes enceintes essentiellement en bonne santé à un dépistage destiné à détecter les signes précoces, ou les facteurs de risque, d'états anormaux ou de maladies, et de faire suivre cette détection d'une intervention efficace et en temps utile. Le programme de soins anténataux recommandé dans les pays en développement est souvent le même que celui appliqué dans les pays développés. Dans les pays en développement cependant, la proportion de femmes qui reçoivent les soins anténataux est soumise à de grandes variations. D'après l'essai randomisé OMS sur les soins anténataux et la revue systématique de l'OMS, il serait

possible d'introduire dans la pratique clinique un modèle de soins prévoyant un moins grand nombre de visites prénatales, sans que cela porte préjudice à la femme ou au fœtus. Ce nouveau modèle de soins anténataux est en cours d'introduction en Thaïlande. Il a nécessité une action à tous les niveaux du système de santé, des consommateurs aux professionnels de santé, au Ministère de la santé publique et aux organisations internationales. L'expérience thaïlandaise est un bon exemple de mise en application pratique des résultats de la recherche et devrait être reproduite ailleurs pour gérer efficacement d'autres problèmes sanitaires.

Resumen

De las investigaciones a la práctica: el ejemplo de la atención prenatal en Tailandia

La finalidad de la prestación de atención prenatal es someter a cribado a las mujeres embarazadas, en su mayoría sanas, para detectar tempranamente los signos o los factores de riesgo de anomalías o enfermedades y responder tras esa detección con una intervención eficaz y oportuna. El programa de atención prenatal recomendado en la mayoría de los países en desarrollo suele coincidir con los programas aplicados en los países desarrollados. Sin embargo, en los primeros la proporción de mujeres que reciben atención prenatal es muy variable. El ensayo aleatorizado de atención prenatal de la OMS y el examen sistemático de la OMS

mostraron que es posible introducir en la práctica clínica un modelo de atención que requiera menos visitas prenatales sin perjuicio alguno para la mujer o el feto. En Tailandia se está aplicando este nuevo modelo de atención prenatal, para lo cual ha habido que adoptar medidas a todos los niveles del sistema de salud, desde los consumidores hasta los profesionales sanitarios, el Ministerio de Salud Pública y las organizaciones internacionales. La experiencia de Tailandia ejemplifica la idea de llevar a la práctica los resultados de las investigaciones, y debería reproducirse en otros lugares a fin de gestionar eficazmente otros problemas de salud.

ملخص

من البحوث إلى الممارسة: مثال على الرعاية السابقة للولادة في تايلاند

السابقة للولادة، إلى أن نموذج الرعاية الذي يشتمل على عدد أقل من زيارات الحوامل لمراقب الرعاية السابقة للولادة يمكن إدخاله في الممارسة السريرية (الإكلينيكية) دون أن يسبب ذلك أي عواقب ضائرة للأم أو جنينها. وينفذ حالياً هذا النموذج الجديد من الرعاية السابقة للولادة في تايلاند. ويتطلب ذلك القيام بإجراءات على جميع مستويات نظام الرعاية الصحية، بدءاً من متلقي الرعاية إلى العاملين الصحيين إلى وزارة الصحة العمومية إلى المنظمات الدولية. وتعد التجربة التي خاضتها تايلاند مثلاً جيداً على تحويل البحوث ونتائجها إلى حيز التطبيق والممارسة، وينبغي تكرارها في أماكن أخرى للوصول إلى التدبير الفعال لمشاكل صحية أخرى.

الخلاصة: إن الأساس المنطقي لإتياء الرعاية في الفترة السابقة للولادة هو تحري النساء الحوامل اللاتي يتمتعن في أغلب الأحيان بصحة جيدة، وذلك لاكتشاف العلامات المبكرة للحالات غير السوية أو للأمراض، أو لاكتشاف عوامل الخطر المرتبطة بهذه الحالات أو الأمراض، وكذلك للقيام بالتدخلات الفعالة في الوقت المناسب لدى اكتشاف هذه العلامات أو عوامل الخطر. ويغلب أن تتماثل برامج الرعاية الموصى بها في الفترة السابقة للولادة في البلدان النامية والبلدان المتقدمة، إلا أن البلدان النامية تعاني من اختلاف واسع النطاق في نسبة النساء اللاتي يتلقين الرعاية السابقة للولادة. وتشير التجارب المعشاة والمراجعات المنهجية التي أجرتها منظمة الصحة العالمية حول الرعاية

References

- Carroli G, Rooney C, Villar J. How effective is antenatal care in preventing maternal mortality and serious morbidity: an overview of the evidence. *Paediatric and Perinatal Epidemiology* 2001;15 Suppl 1:S1-42.
- Villar J, Bergsjö P. Scientific basis for the content of routine antenatal care. I. Philosophy, recent studies, and power to eliminate or alleviate adverse maternal outcomes. *Acta Obstetrica et Gynecologica Scandinavica* 1997;76:1-14.
- Lindmark G, Berendes H, Meirik O. Antenatal care in developed countries. *Paediatric and Perinatal Epidemiology* 1998;12:4-6.
- World Health Organization. *Coverage of maternity care: a tabulation of available information*. 3rd edition. Geneva: WHO; 1989.
- Sikorski J, Wilson J, Clement S, Das S, Smeeton N. A randomized controlled trial comparing two schedules of antenatal visits: the antenatal care project. *BMJ* 1996;312:546-53.
- McDuffie RS Jr, Beck A, Bischoff K, Cross J, Orleans M. Effect of frequency of prenatal care visits on perinatal outcome among low risk women. *JAMA* 1996;275:847-51.
- Walker DS, Koniak-Griffin D. Evaluation of reduced-frequency prenatal visit schedule for low-risk women at a free-standing birth center. *Journal of Nurse-Midwifery* 1997;42:295-303.
- Binstock MA, Wolde-Tsadik G. Alternative prenatal care: impact of reduced frequency, focused visits and continuity of care. *Journal of Reproductive Medicine* 1995;40:507-12.
- Fathalla MF. Preface. *Paediatric and Perinatal Epidemiology* 1998;12 Suppl 2:vii-viii.
- Islam M. Preface. *Paediatric and Perinatal Epidemiology* 2001;15 Suppl 1:v.
- Buekens P. Variations in provision and uptake of antenatal care. *Clinical Obstetrics and Gynaecology* 1990;4:187-205.
- Cochrane AL. *Effectiveness and efficiency. random reflections on health services*. Cambridge: Cambridge University Press; 1989. p. 45-66.
- Fiscella K. Does prenatal care improve birth outcomes? A critical review. *Obstetrics and Gynecology* 1995;85:468-79.
- Fink A, Yano E, Goya D. Prenatal program: what the literature reveals. *Obstetrics and Gynecology* 1992;80:867-72.
- Villar J, Ba'aqeel H, Piaggio G, Lumbiganon P, Belizan JM, Farnot U, et al. WHO antenatal care randomised trial for the evaluation of a new model of routine antenatal care. *Lancet* 2001;357:1551-64.
- Carroli G, Villar J, Piaggio G, Khan-Neelofur D, Gülmezoglu M, Mugford M, et al. WHO systematic review of randomised controlled trials of routine antenatal care. *Lancet* 2001;357:1565-70.
- Villar J, Carroli G, Khan-Neelofur D, Piaggio G, Gülmezoglu M. *Patterns of routine antenatal care for low-risk pregnancy*. Issue 2. Oxford: Update Software; 2002 (Cochrane Review).
- World Health Organization. *WHO antenatal care randomized trial: manual for the implementation of the new model*. Geneva: WHO Programme to Map Best Reproductive Health Practices; 2002.
- Haines A, Jones R. Implementing the findings of research. *BMJ* 1994;308:1488-92.
- Grol R, Grimshaw JM. From best evidence to best practice: effective implementation of change in patients' care. *Lancet* 2003;362:1225-30.
- Haines A, Donald A. Making better use of research findings. *BMJ* 1998;317:72-5.
- Bero L, Grilli R, Grimshaw JM, Harvey E, Oxman AD, Thomson MA. Closing the gap between research and practice: an overview of systematic reviews of interventions to promote the implementation of research findings. *BMJ* 1998;317:465-8.
- Sheldon TA, Guyatt GH, Haines A. When to act on evidence. *BMJ* 1998;317:139-42.
- Costello A, Zumla A. Moving to research partnerships in developing countries. *BMJ* 2000;321:827-9.
- Garner P, Kale R, Dickson R, Dans T, Salina R. Implementing research findings in developing countries. *BMJ* 1998;317:531-5.