

BENEFITS OF A NEONATOLOGY SERVICE IN A RURAL DISTRICT HOSPITAL: CASE STUDY OF RWAMAGANA DISTRICT HOSPITAL / EASTERN PROVINCE OF RWANDA

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ABSTRACT

Background: Neonatal mortality rate is very high (42 ‰) in least developed countries and its reduction will indisputably contribute to the MDG 4. Rwanda is aiming at reducing mortality rate to 15 ‰ live births by 2012. This study aims to highlight the benefits of a neonatology service in a district hospital in terms of early neonatal mortality rate, referral rate, and service utilization frequency.

Methods: The study is retrospective and descriptive. The study population consisted of 391 cases of neonatal pathologies registered out of 2947 live births at Rwamagana district hospital (Eastern province of Rwanda) from 1st January to 31st December 2009. Admissions number, prognosis or outcome, and referrals were checked. Chi square (with Yates' correction) and Fisher exact test were used to compare observed monthly proportions with the situation prevailing in January 2009.

Results: Appointment of a paediatrician, training of staff (medical and nursing), coaching and mentoring, determination of norms, and protocols observance resulted in an impressive decrease in specific early neonatal mortality rate ($p < 0.05$) as well as referral rate ($p < 0.01$), and an increase in admissions number (around 3 times) in the newly created neonatology service.

Conclusion: The experience was successful, and the main recommendation is to maintain this improvement level and extend this experience to the whole country in order to contribute to the MDG 4 in Rwanda.

Key-words: Neonatology - Mortality – Referral rate – Service utilization – Rwanda

RESUME

Introduction: Le taux de mortalité néonatale est très élevé (42 ‰) dans les pays les moins avancés et sa réduction contribuera certainement à atteindre l'Objectif 4 du Millénaire. Le Rwanda vise à réduire la mortalité à 15 pour mille naissances vivantes en 2012. Cette étude a pour objectif de souligner les avantages procurés par un service de néonatalogie dans un hôpital de district concernant le taux de mortalité néonatale précoce spécifique, le taux de références et la fréquence d'utilisation du service.

Méthodes : C'est une étude rétrospective et descriptive à propos de 391 cas de pathologies néonatales enregistrées sur 2947 naissances vivantes survenues du 1er Janvier au 31 Décembre 2009 à l'Hôpital de district de Rwamagana (Province de l'Est du Rwanda). Les paramètres suivants étaient relevés : le nombre d'admissions, le pronostic ou l'issue ainsi que les cas de transfert. Le test de X² (avec correction de Yates) et le test exact de Fisher étaient utilisés pour comparer les proportions mensuelles observées à celle du mois de Janvier 2009.

Résultats : L'affectation d'un médecin pédiatre, la formation du personnel (médical et infirmier), l'entraînement et le mentorat, la fixation des normes et l'application des protocoles ont amené les résultats suivants : une diminution impressionnante du taux de mortalité néonatale précoce spécifique ($p < 0.05$) et du taux de transferts ($p < 0.01$) ainsi qu'une augmentation du simple au triple du nombre d'admissions dans le service de néonatalogie nouvellement créé.

Conclusion : L'expérience fut un succès et la recommandation principale est de maintenir ce niveau d'amélioration et d'étendre cette expérience à l'ensemble du pays en vue de contribuer à la réalisation de l'objectif 4 du Millénaire au Rwanda.

Mots Clés: Néonatalogie - Mortalité - Taux de transfert - Utilisation du service – Rwanda

INTRODUCTION

Every year, 4 millions babies die in the world during the first four weeks of life, and 3 millions in early neonatal period. The neonatal mortality rate is 5 ‰ in developed countries, 33 ‰ in developing countries, and 42 ‰ in least developed countries [1]. In Rwanda, neonatal mortality rate is 28 / 1000 live births while infantile mortality rate is 62 / 1000 live births [2]. Rwanda is aiming at reducing mortality rate to 15 ‰ live births by 2012 [3]. Neonatal deaths and stillbirths are due to poor maternal health, inadequate care during pregnancy, inappropriate management of complications during pregnancy and delivery, poor hygiene during delivery and the first critical

hours after birth, and lack of newborn care [1]. This study aims to highlight the benefits of a neonatology service in a district hospital through the profile of the specific neonatal mortality rate (among inpatients) and to make positive suggestions in order to improve our systemic approach.

METHODOLOGY

The study is retrospective and descriptive. The study population consisted of 391 cases of neonatal pathologies registered out of 2947 live births at Rwamagana district hospital (Eastern province of Rwanda) from 1st January to 31st December 2009. Data were collected from registers and patients' files. The following parameters were concerned: socio-demographic characteristics, birth weight, Apgar

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score, diagnosis, prognosis or outcome, and referrals. Specific neonatal mortality rate was defined as number of deceased newborn / number of hospitalized newborn x 100 %. Run Chart was used as a Quality Assurance tool and method to detect outcomes trends over time [4]. Chi square (with Yates' correction) and Fisher exact test were used to compare observed monthly proportions with the situation prevailing in January 2009.

RESULTS

OVERVIEW ON NEONATAL MORTALITY CASES IN 2009

The annual specific early neonatal mortality rate was 12.3 %. The majority (62.5 %) of deaths were registered within the first 48 hours. Birth weight higher than 2500 g was observed in 41.7 % of cases and 70.4 % of mothers were aged 20 – 35 years. The majority of deceased newborn presented at birth an Apgar score < 5. The four most frequent diagnoses (isolated or combined) were: prematurity (37.5 %), asphyxia (32.5 %), early neonatal infection (30 %), and respiratory distress syndrome (17.5 %).

INPUTS FROM JANUARY TO DECEMBER 2009

The following resources were allocated to Rwamagana district hospital: 1o appointment of a paediatrician with special interest in neonatology and a mandate to create an operational neonatology service through Lux Development and Ministry of Health partnership; 2o capacity building opportunity for the hospital staff (medical and nursing) in delivering emergency neonatal care through on job training and mentoring.

ACTIVITIES FROM JANUARY TO DECEMBER 2009

Some of activities are in fact parts of inputs as far as they relate to human resources training and protocols. The whole package of activities consisted of: theoretical and practical trainings focused on the fight against neonatal hypothermia with implementation of Kangaroo Mother Care (KMC), neonatal resuscitation, early care for high infectious risk cases, preventing nosocomial infection through hospital hygiene, elaboration and explanation of protocols for general practitioners and nurses, bedside teachings, specialized consultations and KMC training in health centers.

OUTCOMES FROM JANUARY TO DECEMBER 2009

Figures 1 to 3 show the results obtained during the year 2009 concerning three main components: specific early neonatal mortality rate, hospital referral rate, and service utilisation.

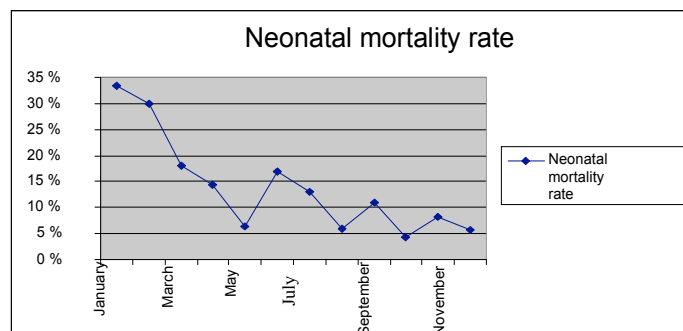


Figure 1. Specific early neonatal mortality rate in 2009

Although oscillating, a gradual decrease of specific early neonatal mortality rate was observed from January (33.3 %) to December 2009 (5.8 %). The difference was statistically significant in May, August, October, November and December 2009 ($p < 0.05$).

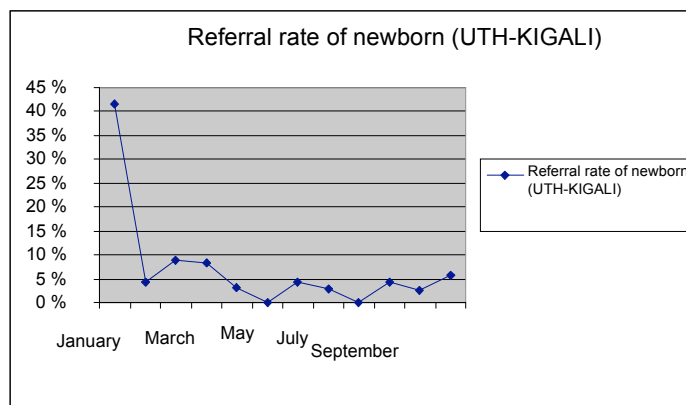


Figure 2. Hospital referral rate in 2009

An impressive decrease in hospital referral rate was noticed from January (50 %) to December 2009 (2 %). The difference was highly significant from February to December 2009 ($p < 0.01$).

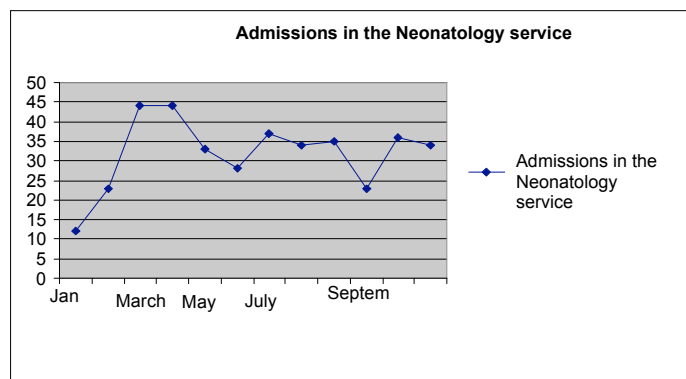


Figure 3. Service utilisation in 2009

An appreciable increase in service utilisation was reached from January (12 cases) to December 2009 (36 cases), with highest levels observed in March and April 2009 (44 cases).

DISCUSSION

The systemic approach was used to improve the quality of health care in the newly created neonatology service at Rwamagana district hospital. Identified problems were the following: high early neonatal mortality rate, high referral rate, and insufficient in-patients' number. Three indicators were accordingly selected to monitor and assess outcomes (specific early neonatal mortality rate, referral rate, and service utilisation frequency). A deep analysis of the situation revealed two main causes: lack of qualified / trained staff (medical and nursing) and nonexistence of norms as evidenced by available protocols. Thus, the need of training staff, establishing protocols, coaching, mentoring, and participating in health care activities was estimated as the big part of inputs and processus likely to improve the system. A significant decrease in early neonatal mortality rate and referrals rate as well as an appreciable increase in service utilisation were realized within a period of one month and maintained all through the year. Although the primum movens of the improvement was represented by the appointment of a paediatrician at Rwamagana district hospital, the improvement approach may be qualified as a systematic team problem solving because the ad hoc team around the paediatrician worked together over a period of time [4]. The concerned team

consisted of physicians, nurses, and other auxiliaries like the ones in charge of hospital hygiene. Teamwork is not only one of the four core principles of Quality Assurance but also highlights the fact that 15 % of health care quality is attributable to performance of individual doctors and 85 % due to performance of systems [4, 5]. In conclusion, one should recognize that the experience was successful, and the main recommendation is to maintain this improvement level and extend this experience to the whole country in order to contribute to the MDG 4 in Rwanda.

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