Report

Using 5S-KAIZEN for Improvement of Patients' Caesarean Section Wound Care at Muhimbili National Hospital in Tanzania

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タンザニアのムヒンビリ国立病院での５S-KAIZEN 活動を通じた帝王切開創部感染ケア改善への取り組み

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〔Abstract〕

A Japanese nurse-midwife research was dispatched to Muhimbili National Hospital in Tanzania as a JICA volunteer from March 2019 to March 2020 within the Master's course of St. Luke's International University and collaborated with hospital staff to develop 5S-KAIZEN as a ward activity. The caesarean section rate was about 58% in Muhimbili National Hospital. Their goal of 5S-KAIZEN was to reduce the number of patients with wound sepsis. To increase staff's knowledge, study sessions were held and the instructor from another ward was invited to teach wound care. New wound dressing care was introduced and a patient educational leaflet was created to give education when discharging patients. Nurses and midwives started the patient education class prior to discharging patients as a routine care including content about infection prevention and nutrition. Patients attrition for education prior to discharge decreased from 35 to 0. Patients' non-adherence, to oral antibiotics and dressing care before discharge, decreased from 10 to 0 and 5 to 0 respectively. Perhaps this implementation contributed to a reduction in wound sepsis. More research is needed.　Sustainability is a challenge for new implementations.

〔Key words〕 Tanzania, JICA, maternal and child health

〔要 旨〕

聖路加国際大学 JICA 連携コースでは2019年３月から１年間，JICA ボランティアが，タンザニアムヒンビリ国立病院に派遣された。産科病棟において，スタッフとともに５S-KAIZEN 活動を実施した。帝王切開率が58％のムヒンビリ病院では，創部感染患の入院や再入院が珍しくなく，５S-KAIZEN の目標は創部感染患者の減少であった。勉強会を開き，講師を招致するなどの知識強化を行い，新しい創部ケア方法も導入された。退院指導用パンフレットを作成し，退院前に患者に対する退院指導クラスが開始された。これら導入後，教育を受けないで退院する患者の数の減少は35人から０人へ，内服薬忘れや退院前の創部ケア忘れはそれぞれ10人と５人から０人となった。創部感染患者の減少にどの程度貢献できたかの実証は次の課題であり，導入された新しいケアの継続性が課題となる。

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〔キーワーズ〕 タンザニア，JICA，母子保健

Ⅰ. Introduction

1. Maternal Health in Tanzania

Tanzania is located on the west coast of the African continent with 58 million population in 2019[1]. Along with MDGs to SDGs, Tanzania has reduced the Under 5 mortality rate of 147 deaths per 1,000 in 1999 to 67 in 2015-16 and the Maternal Mortality Rate from 578 deaths per 100,000 in 2005 to 556 deaths per 100,000 live births in 2015-2016 TDHS[2]. The target of SDGs by 2030 for maternal mortality ratio is less than 70 per 100,000 lives and Under 5 mortality rate as low as 25 pre 1,000 lives[3]. Unlike the Under 5 mortality, little progress had been made in maternal mortality; thus, there is still a high rate that remains the main target which should be tackled. It was reported that the major direct causes of maternal mortality were eclampsia, obstetric hemorrhage, and maternal sepsis[4]. The rate of caesarean section in Tanzania has been increased from 2% in 1996 to 6% in 2015-2016 and it is anticipated that there will be a five-fold increase annually[5] by the number of increase in total deliveries.

2. Muhimbili National Hospital

The Muhimbili National Hospital (MNH) is the largest tertiary referral and teaching hospital in Dar es Salaam in Tanzania with a 1500 bed facility. Referrals are mainly from near-by public and private hospitals, and a few from regional hospitals and self-referral. Admissions into antenatal/postnatal wards are through direct admission from regional referral hospitals, antenatal clinics and transferred from the labor ward. MNH has facilities for comprehensive care for women from pregnancy to postnatal and from low risk to high-risk patients such as antenatal clinic, maternal ward (pregnant and postnatal), surgical theater, neonatal/perinatal ward, and maternal ICU. Doctors, and specialists conduct daily ward rounds[6]. In 2017 there were about 9000 deliveries and 58% of them were caesarean section[7]. Guidelines and Standard Operating Procedures have been developed within obstetrics and gynecology at MNH, which includes procedure with caesarean section patients.

Ⅱ. 5S-KAIZEN Activity with local staff

1. JICA Master's program

St. Luke's International University has been collaborating with the Japan International Cooperation Agency (JICA) volunteer program since 2015 by sending master course students to Tanzania. Once there, students play two roles; one as a JICA volunteer to work with local staff for improvement of their situations and the other as a researcher conducting research at Tanzania. One year prior to dispatch, students in the JICA program course take a course where they visit and learn about Tanzania and MNH staff. A senior student who was dispatched the previous year escorts the new student JICA volunteers. These exchanges with a senior student and the fact that the senior student worked for hospital assists the new volunteer to become acquainted with local staff. Usually, students stay in Tanzania for 1 year and 9 months for voluntary activities. This was the 4th year of the JICA course and dispatches started at the end of January 2019. This nurse-midwife's work as a volunteer started from March 2019. Unfortunately, the 4th year of dispatch ended in March 2020 because of COVID-19 precautions and restrictions.

2. 5S-KAIZEN Activity at maternity antenatal and postnatal ward

1) 5S-KAIZEN procedure

5S-KAIZEN is a method of problem solving and consists of 7 steps (Table 1) from theme selection to standardization. JICA at MNH initiated implementation in 2015, when the JICA course dispatch began. Each Ward had a theme to be improved selected by ward staff. Collaboration work was carried out mainly from Step 3 to Step 6. One of my main activities as a volunteer was devoted to developing a 5S-KAIZEN program for cesarean wound sepsis. The theme of the ward where the nurse-midwife volunteered as a collaborator was, 'reduction in number of patients with wound sepsis'. Ward staff used the term 'wound sepsis' meaning wound infection, which also caused a 'gapping wound'. The nurse-midwife was surprised to find that referral and re-admission patients with wound sepsis (gapping wound) in the ward were not very rare to find.

Table1. The Process of 5S-KAIZEN

Step 1	KAIZEN Theme Selection
Step 2	Situation Analysis
Step 3	Root Cause Analysis
Step 4	Countermeasure Identification
Step 5	Countermeasure Implementation
Step 6	Effectiveness Check
Step 7	Standardization

5S-KAIZEN team has not been tracing the incidence or prevalence therefore they had no statistics about gapping wounds of women with cesarean sections. However, there was data from a report that cumulative incidents rate of surgical site infection is 10.9% with incidents rate 37.5/10000 counted at a territorial hospital at Mwanza in Tanzania[8]. It was also reported that case fatality rate with surgical site infection was 2.9%[8]. It is important to tackle this problem to reduce maternal mortality now and in the future. 5S-KAIZEN may be a key to reducing gapping wounds not only as a cause of maternal mortality but also as a cause of illness.

Figure1. Study Session at Maternity Ward

2）Countermeasure Implementations in Step 5

There are several implementations, which have been conducted as 5S-KAIZEN activity with collaboration with local staff as Step 5. First, to either increase or up-to-date knowledge of nurses and midwives, study sessions were held about wound care for caesarean section and surgical site infection for both ward staff and maternal block (Figure 1). Local staff interest generated active discussions including questions. Then an instructor was invited from a surgical ward to teach us about basic knowledge of wound care and practical application of wound care. Pure honey has been used mainly for gapping wound care in the maternity ward. An alternative method was introduced from this study session, which was using Milton solution. The solution was already a part of practice in surgical ward.

Another implementation was to strengthen the knowledge for mothers in the ward. The education leaflet was developed with advice from ward staff as a tool to provide standard education program before discharging patients. Content of the leaflet includes hygiene and wound care, nutrition, danger signs for mother and baby, breastfeeding and family planning (Figure 2). In the procedure of making the leaflet, it was important to consider the lifestyle of Tanzanian family for practical use. For example, we had to consider that water for hygiene purposes was not always clean enough to wash their wound. Another example was that food for balanced nutrition had to be common food that was possible to get in rural areas. Education classes by the ward nurses and midwives before discharging patients was reinforced (Figure 3) as routine care. They sometimes added their own explanations to patients for better understanding and questions were commonly raised from patients. Sometime if there were only a few patients, they could invite their husband or mother to join them in the education class.

3）Effectiveness Check in Step 6

Step 6 is the procedure of evaluation of implementation activities of Step 5. The comparison of before/after implementation is shown in Table 2. Contributing factor is an index for comparison counted for 4 weeks duration. The number of patients who missed education before discharge decreased drastically from 35 to 0. And also, there were no cases with missed oral drugs and missed dressing care before discharge. Numbers are 10 to 0, and 5 to 0 respectively. It is assumed that

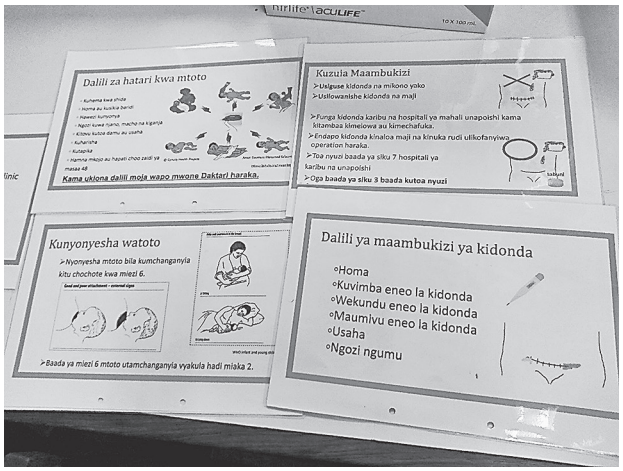

Figure 2. Education Leaflet


Figure 3. Education Class by a staff nurse

the confirmation is positively taken between mother and staff during education class. Number of patients who had wound sepsis decreased from 3 to 0 during the 4 weeks of comparison.

Other than index factors, a new method of dressing care using Milton solution was introduced by nurse manager who attended education session conducted by surgical ward nurse. Discussion was made with the ward round doctor whether it is appropriate for the patients. One patient with contaminated gapping wound had drastically cleaned up with Milton solution (0.4%) after attempting with honey and was able to have a second surgery for wound closing.

3. Challenges for sustainability for Step 7

After only 4 weeks of index comparison, it is not certain that these implementations contributed to the reduction of wound sepsis in patients. But is shows a possibility that these implementations may lead to decreasing wound sepsis. There are some challenges for sustainability for giving health education to patients about to be discharged. It is very difficult to conduct the class when an emergency happens or when wards are overflowed with patients because of a staff shortage and task burdens increase. To put into that context, education session might not be considered a priority for the patients' care. Although Igarashi et al.[7] described the difference of midwifery concept and activity between Tanzania and Japan, it is shown in theme selection of 5S-KAIZEN that the purpose of care that is improvement of maternal health is same for nurses or midwives. It is not easy in Tanzania to solve shortage of staff or develop a printed leaflet to handout to every patient as it is in Japan. It is necessary to show evidence or support their activities, which contribute to the improvement of maternal health to motivate them for sustainability.

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Table 2. Comparison Before and After KAIZEN

Contributing Factor (Frequency within 4 Week)	Before Kaizen	After KAIZEN	Reduction of frequency	Reduction rate
Number of patients discharged without giving health education on wound care	35	0	35	100%
Number of discharged patients who received partial health education on wound care	19	18	1	18%
Number of discharged patients who missed oral antibiotics during discharge	10	0	10	100%
Number of discharged patients who were not changed dressing on discharge	5	0	5	100%
Number of patients with wound sepsis	3	0		

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