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Accelerating the Uptake of Tranexamic Acid to Treat PPH in Zambia

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Abstract

Objective: To identify barriers to utilization of TXA to treat PPH and conduct training and mentorship programs to improve uptake.

Design: A cross sectional study encompassing a sample of 25 health workers among them Doctors, Nurses and Midwives. Participants were drawn from selected hospitals in five provinces namely Central, Eastern, Copperbelt, Lusaka and Southern. The hospitals were selected on the basis that they receive patients at high risk of PPH or receive referred patients with PPH according to information provided by Ministry of Health.

Methods: The study began with a baseline assessment on the availability and usage of Tranexamic Acid (TXA) by collection of information on barriers to uptake captured via questionnaire and checklist sent to trainees of a one-day workshop that took place centrally in Lusaka on 12 September 2019. The training covered the following topics: The Woman Trial - Over view, Accelerating the Uptake TXA to treat PPH in Zambia, Management of PPH, Maternal Mortality in Zambia-Causes (2016-2018 DHIS2 Data/MDSR), Key strategies to addressing maternal mortality in Zambia, The TXA Study Questionnaire, consent form and checklist. Following the training these representatives were tasked to go and disseminate this information to their sites by making presentations with regard to utilisation of TXA with the hope of influencing change at their hospitals. A mentorship visit was conducted between 7 and 16 October 2019 by two specialist obstetricians with criteria for adequacy of TXA availability and use for PPH. An endline visit took place after 07 months in May 2020 to determine the impact of the training and the mentorship visit to all the sites. The same checklist that was used at baseline was administered at this time to determine the availability of items required to treat PPH, including availability of TXA.

Results: Lack of availability of Tranexamic acid was the cause of no increased uptake of TXA. There were limited supplies of TXA from the Ministry of Health (MOH), Zambia at baseline and one hospital had a donation at baseline. At endline, a part from limited supplies from the MOH, most health institutions were buying TXA from their own internally generated funds. Knowledge on benefits of use of TXA was now universal at endline with algorithms for PPH that included TXA in all the sites.

Conclusion: Training and mentorship improved knowledge and usage of TXA among health workers with regard to PPH. Most supplies are done centrally by MOH, not regularly, and not in appropriate amounts to meet the needs of each hospital. There is a need to advocate for TXA to treat PPH, improve the supply chain of this life saving drug and evidence-based practice in Zambia.

Introduction

Postpartum Haemorrhage (PPH) affects approximately 2% of all women who give birth. It is the primary cause of maternal mortality in Low-Income Countries (LIC), and the leading cause of approximately. 25% of maternal deaths globally [1]. In Zambia, approximately 250 deaths/annum were attributed to PPH in 2016.

Tranexamic Acid (TXA) was included in the WHO's 2017 recommendations for the prevention and treatment of PPH. TXA has been shown to reduce death due to bleeding in women with clinically diagnosed PPH by approximately 30% if the treatment is administered intravenously (and in addition to the pre-2017 standard of care) within 3 hours of giving birth [2]. It is available as part of a PPH treatment package free of charge in all hospitals in Zambia, demonstrating the commitment of the Zambian government to reducing deaths due to PPH. However, the drug appears to be underutilised, indicating that there are barriers to the uptake of TXA to treat PPH that are not associated with its availability.

We aimed to identify some of these barriers whilst simultaneously boosting the confidence and competence of healthcare professionals to treat PPH in five Zambian Provinces through training programmes.

Methodology

As a starting point, a baseline assessment of existing status of utilisation of TXA to prevent treat PPH was established by collecting the information from routine data collected at the Ministry of Health (MOH) Zambia by engaging the procurement office and Directorate of Monitoring & Evaluation. This was done by using TXA-utilisation data (proxy-measure) and data on PPH-related deaths reported to the Ministry of Health MOH. We subsequently conducted a day training workshop with representatives from five provinces of Central, Eastern, Copperbelt, Lusaka and Southern from selected hospitals. The hospitals were selected on the basis that they receive patients at high risk of PPH or receive referred patients with PPH according to information provided by the MOH.

This training was preceded by collection of information on barriers to uptake captured via questionnaire and checklist sent to these representatives before they came for the training to a central place in Lusaka on 12 September 2019. 25 people attended the training, among them Doctors, Nurses and Midwives. The training covered the following topics: The Woman Trial-Over view, Accelerating the Uptake of TXA to treat PPH in Zambia, Management of Post-Partum Haemorrhage (PPH), Maternal Mortality in Zambia-Causes (2016-2018 DHIS2 Data/MDSR), Key strategies to addressing maternal mortality in Zambia, The TXA Study Questionnaire, consent form, checklist.

Following the training these representatives were tasked to go and disseminate this information to their sites by making presentations about the utilisation of TXA with the hope of influencing change at their hospitals. Several communication platforms, among them WhatsApp, were used to disseminate information on TXA among staff in hospitals involved in conducting deliveries and likely to come in contact with women who may experience PPH.

A follow-up site visit to the hospitals was conducted by the 2 investigators between 7 and 16 October 2019 with one covering Lusaka, Central and Copperbelt provinces (targeting teaching hospitals) while the other one visited Eastern part of Central and Southern Provinces mainly targeting district hospitals. This visit was aimed at collecting information and reporting on the findings. A check list was administered at this time to determine availability of items required to treat PPH including the availability of TXA. If at least 10 ampoules were available on the day of the interview, the site was considered to have enough TXA. At the end of the interview a PPH drill was conducted to determine if the staffs was aware of and were using TXA. This survey was supported by MOH Zambia and was approved by the University of Zambia Biomedical Research Ethics Committee, approval reference number 003-05-19. Following the training and after the investigators visit on a subsequent occasion, contact continued between the trainees and with the investigators through the WhatsApp platform and sometimes through phone calls if they had questions. During this time the trainees were encouraged to continue lobbying for and using TXA.

After the initial visit by the investigators, which enabled the collection of the study's baseline information, a repeat visit was made in May 2020 to determine the impact of the training and the mentorship. At this time, the same checklist was administered, as at baseline, to determine availability of the items required to treat PPH including the availability of TXA. If at least 10 ampoules were available on the day of the interview, the site was considered to have enough TXA. In addition, statistics related to maternal mortality, where available, were collected from MOH to hopefully show a pattern from 2015 to 2019.

Results

The results relating to Lusaka, Central and Copperbelt provinces (targeting teaching hospitals) and Eastern province including part of Central and Southern Provinces (mainly targeting district hospitals) are shown below under the stated headings:

1. Barriers to the use of TXA
   - Availability of items required to treat PPH
   - Availability and utilisation of TXA
   - Knowledge dissemination among staff in the labour wards, pharmacy and theatre
2. PPH Management
   - Availability of algorithm

1) **Barriers to the uptake of TXA**

a) TXA

i) Availability

Data and information on the availability of TXA, as a barrier to uptake, was collected from the questionnaire. During the site visits, the training was conducted for the 25 staff from the 11 hospitals and the checklist was also administered.

It was observed that only 3 facilities had availability of Tranexamic acid at the time of the site visit in 2019, as reflected in the table below:

b) **Sources of TXA**

From the gathered data, the MoH supplied two batches of TXA to selected facilities. The distribution of the two supplies in 2018 and 2019 are tabulated below. There is no comparison distribution list for 2020; the reason provided for this was the disruption to the supply chain brought by COVID-19. Some hospitals like Mazabuka General Hospital were given donations of TXA from some well-wishers and a pharmaceutical company in 2019. However, we found 2 ampoules of TXA which had expired. Even if TXA was available at the MoH, and in limited amounts, it seems that good procurement managers supported by the hospital administrations. Were able to advocate for their hospitals to ensure that TXA was always available. Some institutions that performed poorly at baseline did improve while others did not improve; despite good knowledge about TXA as reported below in (b).

c) **Knowledge**

During the site visit it became apparent that there were some knowledge gaps on how to manage PPH. One of the gaps amongst the staff that we interacted with in 2019 was how to administer TXA and the infusion of intra venous fluids. However, in 2020 all the staffs in the sites were knowledgeable about TXA and were ready to use it appropriately.

2) **PPH Management**

- Availability of Algorithm
- Does the Algorithm include TXA

Of the visited facilities, all of them included TXA.

Discussion

Tranexamic acid reduces death due to bleeding in women with post-partum haemorrhage with no adverse effects. When used as a treatment for postpartum haemorrhage, tranexamic acid should be given as soon as possible after bleeding onset [1]. Primary post-partum haemorrhage, usually defined as a blood loss of more than 500

mL within 24 h of giving birth, is the leading cause of maternal death worldwide, responsible for about 100 000 deaths every year [3-5]. Most of the deaths occur soon after giving birth and almost all (99%) occur in low-income and middle-income countries [6,7].

From this study is obvious that TXA is available in Zambia but that it is not uniformly or consistently distributed, or in similar quantities (Table 1c). However some institutional leaders, even if they are not obstetricians, have made sure that TXA is always available even if they have to use internally generated funds, if the MoH MOH does not provide the drug.

Typical examples are Ndola and Kitwe teaching hospitals, which are among the 3 major hospitals in Zambia, led by a surgeon and physician in the leadership respectively. At baseline we found no TXA in Ndola which was attributed to over- use by surgeons because of patients experiencing haemorrhage. However, by the endline site visit they had enough TXA which they said was procured from the MoH and they were also prepared to buy TXA if they ran out of stock. Importantly, all of the PPH sets at Ndola included TXA. In contrast, Kitwe hospital had enough stock of TXA both at the baseline and endline site visits.

Monze hospital had zero stocks at baseline but had enough TXA at the endline. This can be attributed to a young specialist posted there who understood the importance of TXA. Another great improvement was seen at Mwanawasa teaching hospital – they had no stock at baseline but more than enough stock at endline. This can also be attributed to a specialist who had been transferred from the Women and New-born Hospital to take leadership of the obstetrics department and was passionate about TXA use (Table 1a and 1b).

Kabwe did not perform well who, apart from being close to Lusaka where it is possible to get supplies, lacked other important stock such as intravenous fluids, gloves etc. The specialist based there was reported to have been away from the station for a long time. The sources of TXA were identified to be mainly from central medical stores and a smaller amount from private sources. One private source was found in Mazabuka where a pharmaceutical company made a donation which was identified at the baseline but not at the endline.

Another option is for health facilities to buy TXA from their own resources, although the managers did not consider this to be a priority. Specialists in Zambia have a WhatsApp group where they

Table 1a: Availability of TXA 1g iv during site visits-2019.

Hospital Name	1 g IV vials needed	1 g IV Available	Comment
Mumbwa District Hospital	10	0	TXA not available; Have never been supplied before
Nyimba District Hospital	10	0	TXA not available; Have never been supplied before
Petauke District Hospital	10	0	TXA not available; Have never been supplied before
Mazabuka General Hospital	10	8	Available from a donation by a pharmaceutical company
Monze General Hospital	10	0	Not available
Kapiri mposhi Dist Hospital	10	0	Not available
Women and Newborn UTH	10	20	Plenty, supplied
Levy Mwanawasa Teaching Hospital	10	0	Out of stock
Kabwe Central Hospital	10	0	Not available, None in stock
Ndola Teaching Hospital	10	0	Not available, None in stock
Kitwe Teaching Hospital	10	15	Available, supplied by MOH

Source of Data: Checklist administered in Labour wards and observation from PPH Kit.

Table 1b: Availability of TXA 1 g IV during site visits-2020.

Hospital Name	1 g IV vials needed	1 g IV Available	Comment
Mumbwa District Hospital	10	2	Bought with user fees-an improvement
Nyimba District Hospital	10	0	TXA not available; Have never been supplied before
Petauke District Hospital	10	0	TXA not available; Have never been supplied before
Mazabuka General Hospital	10	2	Available from a donation by a pharmaceutical company-expired
Monze General Hospital	10	10	Improved from baseline
Kapiri mposhi Dist Hospital	10	0	Not available
Women and Newborn UTH	10	0	Not available due to overuse
Levy Mwanawasa Teaching Hospital	10	60	Was zero at baseline
Kabwe Central Hospital	10	0	Not available, None in stock
Ndola Teaching Hospital	10	10	Was zero at baseline due to overuse
Kitwe Teaching Hospital	10	10	Available, supplied by MoH

Source of Data: Checklist administered in Labour wards and observation from PPH Kit.

Table 1c: Tranexamic acid distribution list.

		2018			2019			2020-no list available		
S/N	**Facility Name**	**No. of Health centres received TXA**	**UNIT**	**TOTAL**	**No. Health centres received TXA**	**UNIT**	**TOTAL**	**No. Health centres received TXA**	**UNIT**	**TOTAL**
1	Ndola	9	12	220	9	10	90			
2	Kitwe	14	12	168	14	5	70			
3	Luanshya	6	12	72	6	5	30			
4	Masaiti	32	12	384	32	5	160			
5	Mpongwe	12	12	144	12	5	60			
6	Kalulushi	13	12	155	13	10	130			
7	lufwanyama	22	12	265	22	10	220			
8	Mufulira	7	12	84	7	10	70			
9	Chingola	14	12	168	14	5	70			
10	Chililabombwe	3	12	50	3	10	30			
11	Ndola Teaching Hospital	1	500	550	1	200	200			
12	Kitwe Teaching Hospital	1	500	500	1	250	250			
13	Nchanga North Hospital	1	60	60	1	30	30			
14	Ronald Ross General Hospital	1	60	60	1	30	30			
15	Roan Antelope General Hospital	1	60	60	1	30	30			
16	Kabwe General Hospital	1	60	60	1	30	30			
		138	**1360**	**3000**	**138**	**645**	**1500**	**0**	**0**	**0**

Table 2: Hospitals and availability of an algorithm for PPH that includes TXA.

Algorithm available		
Hospital Name	**Yes**	**No**
Mumbwa District Hospital	Yes	
Nyimba District Hospital	Yes	
Petauke District Hospital	Yes	
Mazabuka General Hospital	Yes	
Monze General Hospital	Yes	
Kapiri mposhi Dist Hospital	Yes	
Women and Newborn UTH	Yes	
Levy Mwanawasa Teaching Hospital	Yes	
Kabwe Central Hospital	Yes	
Ndola Teaching Hospital	Yes	
Kitwe Teaching Hospital	Yes	

Source of Data: Questionnaire administered in Labour wards and observation from PPH Kit.

discuss best practices, especially after they held the annual symposium under the umbrella of their Association, the Zambia Association of Gynaecologists and Obstetricians (ZAGO). It is no wonder that the smaller district hospitals did not perform well in terms of having supplies both at baseline and endline as there is no specialist to give them this kind of leadership. There is need to conduct training on the Use of TXA in PPH management in the district hospitals to increase uptake.

Obstetric haemorrhage remains the commonest cause of maternal mortality in Zambia. In the sites visited, of the 49 women experiencing obstetric haemorrhage, 46 (93.9%) was due to PPH according to the 2019 records. This included the big hospitals and confirms the need to roll out TXA use throughout the country. Of these deaths, strangely most deaths occurred in the health facilities rather than in the community. It is gratifying that big hospitals, which are more likely to receive referrals of PPH and its complications, have now embraced the use of TXA and that almost all facilities had PPH algorithms that include TXA. In Rwanda, a program targeting 21 health centres in two rural districts that supported the implementation of MOH evidence-based protocols demonstrated significant improvement in a number of quality-of-care indicators. Emphasis on individual provider and systems-level issues, integration within MOH systems, and continuous monitoring efforts were instrumental to these successes. Their experience and results demonstrate that it is feasible to rapidly implement a district-wide, nurse focused mentorship program that addresses quality of care at both individual provider and systems levels. This strategy has meaningful potential to support nurses and improve the quality of care delivered in rural Rwanda, as well as other resource-limited settings [7].

Similar, another study found that incorporating mentorship and coaching activities into health systems strengthening strategies was associated with improvements in quality of care and health systems, and mentorship and coaching represents an important component of health systems support activities designed to improve not just coverage, but even further effective coverage, in achieving Universal Health Care [8].

Conclusion

Training and mentorship improved knowledge and usage of TXA among health workers with regard to PPH management. Most supplies

are done centrally by MOH, not regularly and not in appropriate amounts to meet the needs of each hospital. There is need to advocate for TXA to treat PPH, improve the supply chain of this life saving drug and evidence based practice in Zambia.

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