Turning the tide of blood safety in resource-limited settings: Influence of research efforts

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PLAN

- Introduction
- Background of transfusion in Cameroon
- Research Efforts
- Contributions to policy and development
- Challenges
- Conclusions and recommendations
INTRODUCTION
Introduction

Blood safety: concern in resource-limited settings (RLS)

Various factors contribute: policies, infrastructures, logistics, human resources, capacity-building etc.

But Paucity of data significant

Hence, reduced impact on policy makers
BRIEF PRESENTATION OF CAMEROON

- Central African Country
- Africa in miniature
- Capital city: Yaoundé
- Area: 475,442 km²
- Population: ~18 millions
- Density: 34 persons/km²
- 17.1% < 1 USD/day
- Illiteracy rate: 11.5% (2005)
- Life expectancy: 50 years (WHO, 2004)
- Density of Medical Doctors/1000: 0.19 (WHO, 2004)
- Density of Nurses/1000: 1.6 (WHO, 2004)
- Official languages: French and English
- Ethnic groups: more than 240
- 10 administrative Regions
- Presidential system of gov’t
- Country of football
Background on Transfusion in Cameroon

- Transfusion practice is not standardized
- Most Transfusion Services are still integral parts of hospital laboratories; no adapted structures
- No budget allocations and no staff delegated specifically for transfusion
- Few trained staff, concentrated in Yaounde & Douala
Historical Perspectives of transfusion in Cameroon

- **1945**: 1st blood obtained from Centre Pasteur, Dakar
- **1952**: Earliest notions of donations in Cameroon
- **1959**: Creation of special blood donor diploma (Arrêté n°18/MSP/BT1 du 28 avril)
- **1996**: 1st National Blood Transfusion guideline
- **2001**: National blood transfusion policy
- **2003**: Blood transfusion Law (Law n°2003/2006 of 22/12)
Historical Perspectives of transfusion in Cameroon*

<table>
<thead>
<tr>
<th>YEAR</th>
<th>No. OF BLOOD DONATIONS</th>
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<tr>
<td>1956</td>
<td>273</td>
</tr>
<tr>
<td>1960 (independence)</td>
<td>438</td>
</tr>
<tr>
<td>1961</td>
<td>277</td>
</tr>
<tr>
<td>1968</td>
<td>2500</td>
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1971 – Transfusion activities transferred to Blood Bank of HCY

*Source: Rapport annuel, Institut Pasteur de Cameroun, 1956-1971, Box 39 IPO-RAP, Archives of Institut Pasteur, Paris
INTRODUCTION: Blood Transfusion Safety

- Cuts across all disciplines of medicine
- Numerous adverse effects associated
- Thus, need for scrupulous implementation of blood safety procedures throughout the blood safety chain.
Blood Safety

- The blood safety chain begin with establishment of policies, laws and regulations governing it.
- The implementation of these are indispensable.
- Thus, a key arm to blood safety is government commitment.
Blood Safety

- In Cameroon, in most instances baseline data is still unavailable in several aspects of transfusion.
- Such data may set the stage for more political commitment to enhance blood safety.
This presentation samples aspects of basic laboratory work and research undertaken in Cameroon and the impact on blood safety at various levels including policy makers (policy & development).
BASIC LABORATORY and RESEARCH WORK
1. Situational Analysis – Clinical Usage

Blood prescription and uses in hospital services of HCY, using pre-structured questionnaires in the form of “Blood Request Forms” (Mbanya & Kaptue, Sem Hop; 1995)

- Found inappropriate indications & uses

- Pediatrics, then Obs/Gyn highest consumers

**Intervention:** Organised educational sessions staff/MS
Outcome:
- Contributed to idea of the development of the 1st transfusion guideline for Cameroon
- In collaboration with WHO and MOH (1996)
Clinical Transfusion practices

- Anthropological analysis of transfusion practices of 2 UTH and a rural hospital (Kamdem Simeu, 2010):
  - Huge variations in practices, even between the 2 UTH of the same city
  - Recommendation: Urgent need to harmonize transfusion throughout the national territory

Haemovigilance
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<th>Outcome</th>
<th>Yr 1</th>
<th>Yr 2</th>
<th>Yr 3</th>
<th>Yr 4</th>
<th>Yr 5</th>
<th>Total</th>
<th>%</th>
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<td>4533</td>
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<td>5644</td>
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<td>2900</td>
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<td>10819</td>
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<td>781</td>
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<td>-</td>
<td>-</td>
<td>1</td>
<td>4</td>
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<td>DHR</td>
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<td>-</td>
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<td>-</td>
<td>-</td>
<td>1</td>
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<td>0.003</td>
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<td>4</td>
<td>3</td>
<td>3</td>
<td>-</td>
<td>12</td>
<td>0.04</td>
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<td>Hypothermia</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Deaths</td>
<td>6</td>
<td>9</td>
<td>10</td>
<td>8</td>
<td>5</td>
<td>38</td>
<td>0.14</td>
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<tr>
<td>TOTAL (%)</td>
<td>3798</td>
<td>4520</td>
<td>3170</td>
<td>2637</td>
<td>1982</td>
<td>16107</td>
<td>59.7</td>
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Haemovigilance

**Intervention:**
- Organised seminar for hospital staff on adverse effects of transfusion

**Recommendation:**
- Need for organized haemovigilance programme
Blood donors
Blood donor selection

- Strategies for blood donor selection have been evaluated in African countries including Cameroon (Tayou et al, 2012)
  - Various risky sexual activities dominated deferrals

- **Recommendations:**
- Need for more stringent donor selection criteria, given the magnitude of TTI in the region.

Blood donor selection

- A study evaluated the characteristics of blood donors & donated blood in 7 countries of the African region (Tayou et al, 2009):
  - 6 of 7 had < 50% trained staff in Transfusion
  - 1 only had fully written SOP
  - Emphasized need for capacity building

Tayou Tagny et al; Transfusion 2009 Aug; 49 (8): 1592 – 9.
Transfusion Transmissible Infections (TTI)
Transfusion Transmissible Infections

- **HCV among multiply-transfused SS:**
  
  23.9% positive compared to 3.2% in non-transfused SS (Kemmegne et al, Med. Trop; 1996) ¹

- **Infectious markers amongst people living with haemophilia** (Fombutu T, 2010) ²
  
  Prevalence of anti-HCV was 13.5%, mainly those transfused before systematic HCV screening (WFH & Factor Concentrates)

- **Recommendation:** Obligatory HCV screening in blood banks

Transfusion Transmissible Infections (TTI)

- **Serology among 1st time donors** (Transf. Med; 2003):
  - Overall 25.3% infected: HIV-7.9%; HBV-10.7%; HCV-4.8%, Syphilis- 9.1% and HTLV-1 – 1.6%

- Similar findings on TTIs in donors
  (Musi et al, 2004; Mbanya & Tayou, 2005)

  **Recommendations:**
  - Emphasized need for strict donor selection criteria
Transfusion Transmissible Infections (TTI)

Residual risk for HIV in blood donors was evaluated, (Tayou et al, 2011)

Recommendations:

- Emphasized the need for appropriate screening tests
Transfusion Transmissible Infections

**Malaria**: EHA, 2002: ~ 66.5% healthy blood donors → falciparum malaria (Antigenic studies)

- **Basis for review** of malaria in blood donors in our region

  (Mbanya D & Tayou Tagny C, Africa Sanguine, 2007, 10: 23–27)

  to reiterate that **Malaria is a major TTI affecting blood safety in SSA**
Transfusion Transmissible Infections: New strains

- Hepatitis B Virus (HBV):
  New subgenotype of HBV (A3) in Cameroon from blood donor samples (J. General Virology, 2005)

- Various studies on HIV genetic diversity in Cameroon

- Possible impact: on the screening methods & diagnosis
Quality
Quality

Quality of Red Cells transfused:
- Only 57-80% units conformed with ISO norms, but 66-95% units conformed with Algerian norms (Mbanya et al, 2007)

Stability of FFP (stored in household freezers):
- FVIII↓ very rapidly by Day 30,
- FII, V and VII relatively stable for 90 days (Ndoumba A. 2011)

Recommendation: need for establishing local/national norms and conditions in our settings.

CONTRIBUTIONS TO POLICY AND PATIENT BLOOD MANAGEMENT IN CAMEROON
Contributions to policy, national health & development

**MOH/NACC:**

- Capacity building of Health Care Personnel within the health care system
  - Laboratory technicians; Physicians
  - Blood donor recruitment training etc.
- Production of the 1st Transfusion guideline (1996)
2008:
C Tayou Tagny
D Mbanya

A technical handbook for the Laboratory of blood transfusion in Cameroon
Contributions to policy, national health & development

**MOH/NACC:**
- Set pace for discussions on a policy for blood transfusion (achieved 2001)
- Transfusion Law promulgated in 2003
- Routine HCV testing in blood banks - operational
Contributions to policy & national development

**MOH/NACC:** Blood safety considerations

- Reviewing transfusion policies *(NBTS in view)*
- National Guidelines for QA in HIV testing (achieved)
- National policy on sickle cell disease (ongoing)
- National strategic plan for Haemophilia & bleeding disorders *(ongoing)*
Challenges

- Administrative bottlenecks
- Non-implementation of established policies
- Non Standardization of transfusion practices
- Lack of resources:
  - HR (numbers, competencies, commitment…)
  - Infrastructure
  - Logistics
Conclusions

- Operational research is an essential arm of blood safety
- Where transfusion is indispensable, safe blood should be at least guaranteed
THANK YOU FOR YOUR ATTENTION