THERAPEUTIC APHERESIS IN AFRICA

Dr Fatiu A. Arogundade, MBBS, FMCP, FWACP, ISN Fellow
Associate Professor of Medicine,
Obafemi Awolowo University,
Ile-Ife, Nigeria.

Conflict of Interest – Co investigator in NIH sponsored project

Presented by Rasheed A Balogun, Univ of Virginia
Rasheed A Balogun & Fatiu A. Arogundade at OAU, Ile-Ife 2011
Outline

- Introduction

- TPE services in Selected African Countries.

- Peculiar indications for TPE in Africa

- To highlight the challenges to TPE in Africa

- To propose ways of improving TPE
Brief Information on Africa:

- Africa 2\textsuperscript{nd} largest continent
- 2\textsuperscript{nd} most populous continent
- Africa homes 54 sovereign African states.
Population: 1.033 Billion
Projections:
- 1.4 Billion - 2025
- 1.9 Billion - 2050

65-70% rural population.

GDP per capita of less than $1500.

Life Expectancy
- 73.9 Yrs – Mauritius
- 46.5 in Sierra Leone
Definition of Resource Limitation

- **Income group:** Economies are divided according to 2012 GNI per capita.
  - **Low income:** $1,035 or less
  - **Lower middle income:** $1,036 - $4,085
  - **Upper middle income:** $4,086 - $12,615
  - **High income:** $12,616 or more.

- Nigeria $2,450
- USA $52,610
TPE in Nigeria

- Anecdotal reports

- 2 case reports
  - Use in Waldestroms macroglobulinemia and Myastenia Gravis (UCH, Ibadan).

- Nephrology – TPE in SLE complicated by TTP – OAUTHC, Ile-Ife.
TPE in Nigeria


- Benefit of modified plasmapheresis in the management of myasthenia gravis: a case report.

- Poor financial state of our patients

- Dearth of appropriate equipment

- He was admitted in the ICU for respiratory support where he also had modified plasma exchange.

- In the absence of facilities for standard plasmapheresis in this environment, the use of modified plasmapheresis is hereby recommended.
Waldenstrom's macrogloblinaemia: modified plasmapheresis as treatment option in a Nigeria setting.

56 year old Negroid male, to whom modified plasmapheresis/plasma exchange was offered with good control of symptomatic hyperviscosity.

Amelioration of the clinical status.

Highlighted the need to adopt a modification of manual plasmapheresis.
TPE in Nigeria

- 2 Cases of SLE complicated by TTP and managed by filter membrane based TPE
- Highlighted the fact that we may be missing TTP
- We need to develop TPE programs

SURVEY QUESTIONNAIRE

1. Name of country? Estimated population?
2. Is Therapeutic Apheresis or its applications available in your country? If not why? If yes in how many centers?
3. Which group of specialists perform Therapeutic Apheresis or its applications in your Country?
4. What are the major indications for Therapeutic Apheresis or its applications?
5. What percentage of Nephrologists know about Therapeutic Apheresis or its applications?
6. What percentage of Nephrologists will be willing to learn about Therapeutic Apheresis or its applications?

7. Do you think the knowledge of Therapeutic Apheresis or its applications is necessary? If yes why? If no why?

8. Do you have any suggestions on ways of improving the practice of Therapeutic Apheresis or its applications.

9. How will you rate your knowledge of Therapeutic Apheresis or its applications?

10. Will you like to learn more about Therapeutic Apheresis or its applications?
Morocco

- Estimated population - 34 million

- Is Therapeutic Apheresis or its applications available in your country? If not why? If yes in how many centers?
  - 2 sites (University Hospitals of Casablanca and Fez)

- Which group of specialists perform Therapeutic Apheresis or its applications in your Country?
  - **Casablanca**: Hematologists (cytapheresis in blood transfusion center, plasmapheresis recently acquired in nephrology department)
  - **Fez**: Nephrologists (plasmapheresis in nephrology department)
Egypt

- Population - 83 million.

- Is Therapeutic Apheresis or its applications available in your country? If not why? If yes in how many centers?
  - Yes, in most university hospitals and some private centers. Total estimate about 30 centers.

- Professionals involved:
  - Nephrologists, Intensivists, Hematologists.
ETHIOPIA

- Population 90 Million.
- There are no therapeutic apheresis facilities in Ethiopia.
Zambia

- Population 14.2 Million
- No therapeutic apheresis facility in the country.
Malawi

- Population: 15 Million
- No therapeutic apheresis facility in the country.

- No Response (s) from Sudan, Tunisia, Ghana, Senegal, Cameroon, Tanzania.
Republic of South Africa

- Founded in 2001
- Merger of 7 blood centres
- Provides all patients with sufficient, safe quality blood products and services related to blood services.
Services provided include the following:

- **Red Cell Products** – Non and Leucodepleted, Buffy coat removal
- **Platelet products** - Non and Leucodepleted
- **Plasma Products** – Cryo, FFP, HLA matched.
- **Autologous direct blood transfusion programmes.**
- **Chemically washed blood products.**
- **Cryo-preserved Progenic cells**
# Peculiar indications for apheresis services in Africa

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>TTP&lt;br&gt;GBS</td>
</tr>
<tr>
<td>II</td>
<td>Complicated Myastenia gravis - Crisis&lt;br&gt;Transplantation / rejection&lt;br&gt;Lupus Cerebritis&lt;br&gt;Good pastures syndrome&lt;br&gt;Severe Sickle Cell Crisis&lt;br&gt;Severe Parasitaemia – Malaria</td>
</tr>
<tr>
<td>III</td>
<td>CIDP</td>
</tr>
<tr>
<td>IV</td>
<td>NIL</td>
</tr>
</tbody>
</table>
South African National Blood Service (SANBS) - TTP treatments in 2012-2013

- Retrospective review
- April 2012 - September 2013

RESULTS:
- 45 patients with a TTP diagnosis,
- 29 were female (57.8%),
- 16 male (42.2%)
- Average age of 35.2 years (female 32.6 years, male 39.8 years, p=0.021, t-test).
- Only 27 of 45 HIV results were available:
  - 22/27 (81.2%) were HIV positive
CHALLENGES OF ESTABLISHING APHERESIS SERVICE IN AFRICA
Challenges of starting apheresis program

- Technical expertise
  - Personnel
  - Training
  - Curriculum
  - Workshops

- Results of recent survey
A Survey of Nigerian Nephrology Professionals on Therapeutic Apheresis – Unpublished

Specialisation / Expertise of Respondents

- Physician - Nephrologist: 16.43%
- Physician - Senior Registrar: 1.3%
- Physician - Registrar: 4.11%
- Nephrology Nurse: 3.8%
- Dialysis Technician: 13.35%
Assessment of current level of awareness (knowledge)

Assessment of knowledge by respondents

- None: 5.6%
- Minimal: 52.8%
- Moderate: 38.9%
- Significant: 2.8%
Previous participation / observation in Apheresis treatment.

**Participation or observation of apheresis treatment**

- **86.4%, 86%**
- **13.6%, 14%**

**Legend:**
- Participated / Observed
- Nil Participation at all
Interest of respondents in learning about apheresis

Willingness to learn about apheresis

- Yes, I want to learn more: 97.9%
- Nil response: 2.1%
Assessment of current level of awareness (Nephrologists)

Assessment of knowledge by Nephrologists

- 9.56% (None)
- 6.38% (Minimal)
- 1.6% (Moderate)
- 0.0% (Significant)
Previous participation / observation in Apheresis treatment. (Nephrologists)

Participation or observation of apheresis treatment by Nephrologists

- 14, 88%
- 2, 12%

World Apheresis Academy - San Francisco, 2014
Interest of Nephrologists in learning about apheresis

Nephrologist's willingness to learn about apheresis

- Yes, I want to learn more: 15.94%
- Nil response: 1.6%
## Assessment of practice of TPE in Africa

<table>
<thead>
<tr>
<th>NO</th>
<th>SURVEY QUESTIONS</th>
<th>COUNTRY</th>
<th>RESPONSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>What percentage of Nephrologists know about Therapeutic Apheresis or its applications?</td>
<td>Morocco</td>
<td>3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Egypt</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ethiopia</td>
<td>0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Zambia</td>
<td>2/3 = 66%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Malawi</td>
<td>1/1 = 100%</td>
</tr>
<tr>
<td>2</td>
<td>What percentage of Nephrologists will be willing to learn about Therapeutic Apheresis or its applications?</td>
<td>Morocco</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Egypt</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ethiopia</td>
<td>4/9 = 44%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Zambia</td>
<td>All 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Malawi</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Do you think the knowledge of Therapeutic Apheresis or its applications is necessary? If yes why? If no why?</td>
<td>Morocco</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Egypt</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ethiopia</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Zambia</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Malawi</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Do you think the knowledge of Therapeutic Apheresis or its applications is necessary? If yes why? If no why?

- Necessary for some nephrologists working in tertiary level hospitals. It offers a therapeutic alternative for some pathologies.

- Yes, being part of the treatment protocols in many kidney disorders.

- Yes, the knowledge will be useful to help patients with the right indications.

- We are willing to start providing the treatment.

- No diagnostic capability to diagnose conditions requiring it.
Assessment of knowledge of TPE in surveyed Countries in Africa

Countries surveyed

- Good: 40
- Weak: 40
- Poor: 20
Willingness to learn more about Therapeutic Apheresis or its applications in survey participants / Countries

Willingness to learn more about TPE

0

100

YES

NO
Challenges of starting apheresis program

- Funding (Cost considerations)
  - Mainly out of pocket
  - ? Sustainability
  - Insurance (NHIS)
  - Subsidy
• Tertiary healthcare:
  ➢ Available in specialist/university teaching hospitals located in major cities.
  ➢ Government subvention only covers staff emoluments and equipments.
  ➢ No reimbursement for cost of treatment
  ➢ National health insurance scheme (<15 years)
    • Covers <1% of the population
    • Only for primary and some secondary care services
    • Does not include MOST tertiary care services such as dialysis/ transplant
FUNDING OF KIDNEY TRANSPLANT MANAGEMENT IN NIGERIA

<table>
<thead>
<tr>
<th>SOURCES</th>
<th>TRANSPLANT SURGERY</th>
<th>MAINTENANCE THERAPY</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIVATE / PERSONAL</td>
<td>48 (33.6%)</td>
<td>107 (74.8%)</td>
</tr>
<tr>
<td>EMPLOYER</td>
<td>34 (23.8%)</td>
<td>34 (23.8%)</td>
</tr>
<tr>
<td>PHILANTHROPISTS</td>
<td>13 (9.1%)</td>
<td>NIL (0%)</td>
</tr>
<tr>
<td>OTHER DONATIONS</td>
<td>31 (21.7%)</td>
<td>NIL (0%)</td>
</tr>
<tr>
<td>NGO</td>
<td>2 (1.4%)</td>
<td>2 (1.4%)</td>
</tr>
<tr>
<td>GOVERNMENTAL SUPPORT</td>
<td>15 (10.5%) (AD-HOC)</td>
<td>NIL (0%)</td>
</tr>
<tr>
<td>HEALTH INSURANCE</td>
<td>NIL (0%)</td>
<td>NIL (0%)</td>
</tr>
</tbody>
</table>

Challenges of starting apheresis program

- Replacement fluids (Sourcing)
  - Plasma
  - Albumin
  - Colloids

- Machines
  - Few Machines
    - Membrane based
    - Centrifugation based
  - Few Centres
CONCLUSION

- Establishment and Improvement of TPE services in Africa would require
  - Improvement in training / teaching.
  - Improved funding (Govt or Insurance)
  - Adequate provision of manpower and resources.
  - Improved knowledge of management of complications.
THANK YOU