



Survey of facilities for appropriate training in blood transfusion in Anglophone West Africa

Les établissements de sang d'Afrique de l'Ouest Anglophone

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Training in Blood Transfusion in West Africa

ABSTRACT

Background

Several different categories of professionals, including graduate and specialist medical personnel, nurses and medical laboratory scientists amongst others are engaged in blood transfusion establishments worldwide. Some knowledge by workers outside their own specific specialty and a high degree of integration are required for effectiveness in blood services.

Objective

To survey training facilities for blood transfusion in Anglophone West Africa for appropriateness, and to identify areas of deficiency requiring rectification.

Methods

The contents of training curricula of various institutions were scrutinized. Serving members of blood establishments were interviewed to ascertain their background professional training and present role in their blood establishments.

Results

Sufficient numbers of graduate and specialist medical personnel nurses and medical laboratory scientists are being produced in the Region, to provide workforce for blood transfusion establishments. However, there is deficiency of knowledge across professions with resultant suboptimal integration of roles, and effectiveness of the services. Some categories of personnel are not appropriately trained and not placed in career schemes.

Recommendations

Supplementary training is recommended for all categories of personnel, to promote efficiency and effectiveness in blood establishments.

RÉSUMÉ

Contexte

Plusieurs catégories différentes de professionnels, y compris des personnels médicaux diplômés et spécialisés, des infirmières et des scientifiques du laboratoire médical, entre autres, sont recrutés dans des établissements de transfusion sanguine dans le monde entier. Certaines connaissances des travailleurs en dehors de leur spécialité spécifique et un haut degré d'intégration sont nécessaires pour être efficaces dans les services de sang.

Objectif

Mener des enquêtes sur les établissements de formation en transfusion sanguine en Afrique de l'Ouest anglophone pour déterminer leur pertinence et identifier les domaines d'insuffisance nécessitant une amélioration.

Méthodes

Le contenu des programmes de formation de diverses institutions a été examiné. Des membres des établissements de transfusion sanguine ont été interrogés pour déterminer leur formation professionnelle de base et leur rôle actuel dans leurs établissements de transfusion sanguine.

Résultats

Un nombre suffisant d'infirmiers diplômés et de personnel médical spécialisé et de scientifiques de laboratoire médical sont produits dans la Région, pour fournir de la main-d'œuvre aux établissements de transfusion sanguine. Cependant, il y a un manque de connaissances dans les professions, ce qui entraîne une intégration insuffisance des rôles et une efficacité limitée des services. Certaines catégories de personnel ne sont pas correctement formées et ne sont pas intégrés dans des plans de carrière.

Recommandations

Une formation complémentaire est recommandée pour toutes les catégories de personnel afin de promouvoir l'efficacité et l'efficacité dans les établissements de transfusion sanguine.

INTRODUCTION

A standard blood service is a multi-disciplinary organization in which many different professionals are engaged. These include majorly, the medical, the scientific and technical, and the nursing personnel.

The effectiveness of a blood service is determined not only by the availability of suitable equipment and other working materials in a conducive working environment, but also by the adequacy and efficiency of personnel who are suitably trained for the roles they have to perform in the service. For each category of professionals, different basic academic and professional qualifications are required, but there are also abilities that are peculiar to blood handling and management, which are required by all cadres. Availability of facilities and systems for relevant training is one of the factors that make for an effective and efficient blood service. This article is the report of a survey of available institutions and programs in the Anglophone West Africa, for the training of personnel for work in blood transfusion.

Information was gathered from the published curricula of various training institutions and programmes. Teachers and students in the institutions and workers in blood services and hospital blood transfusion departments also supplied information through self-administered, structured questionnaires, and by direct interviews in some cases.

THE TRAINING OF MEDICAL PERSONNEL FOR BLOOD TRANSFUSION SERVICE

Basic Training

In the Anglophone West African Countries, namely Nigeria, Ghana, Liberia, Sierra Leone and the Gambia, the training of medical doctors as in most other places, is based in the Universities. In most Universities in the Region, students enter in to the medical undergraduate programme after completing secondary or grammar school education and obtaining the West African School Certificate, (WASC) with at least credit passes in English Language, Mathematics and the core science subjects of biology, chemistry and physics. The WASC is the equivalent of the GCE ordinary level of the United Kingdom, the former colonial masters. A few students enter with the Higher school certificate (HSC) which is equivalent to the GCE Advanced Level or with a first university degree in any related science discipline.

The WASC entrants spend six years to qualify as medical doctors, while the HSC and B.Sc. entrants are exempted from the first undergraduate year and spend five years to qualify.

The second (200level) and third (300 level) years of the Medical Undergraduate Programme are devoted to the preclinical basic science studies, the fourth (400 level) to pathology and pharmacology and the fifth (500L) and sixth (600L) years to the clinical studies of internal and community medicine, surgery and obstetrics and gynecology. Some universities introduce variations into the basic arrangement of courses to achieve greater integration. It is in the pathology course that students learn about the theoretical and laboratory aspects of blood transfusion. Although blood transfusion is taught at this level as a subspecialty of the broader Haematology discipline, there is sufficient content of blood transfusion for the level of training up to the first medical degree of MBBS or MBCHB.

However, while the fresh medical graduate is sufficiently equipped to apply the knowledge of blood transfusion to patientcare, he or she is not anywhere near being prepared to work in a blood transfusion service.

POSTGRADUATE PROFESSIONAL OR SPECIALIST TRAINING

In contrast to the undergraduate medical programme, the professional training of pathologists or haematologists is not based in the University. Like in the British system which was inherited by the erstwhile Anglophone Colonies, Postgraduate Professional Medical Training including haematology is undertaken under the auspices of a body of specialists called a College.

Individual countries like Nigeria, and more recently, Ghana, have their National Postgraduate Medical College while the five Anglophone West African Countries jointly operate a West African Postgraduate Medical College. This system of professional medical training is called a Residency Programme and the trainees are called Resident Doctors. The graduates of the colleges are called Fellows of the respective colleges. There is a published training curriculum¹ for pathologists, which is very similar for all the colleges, and there is reciprocity of recognition of the qualification across the five countries. Pathologist training covers a minimum period of 4 years but could extend to 5 or 6 depending on the trainee's progress.

In the first half of the training programme (Part I) the resident doctor rotates through the four major division of pathology, while in the Part II, he/she concentrates on the one subspecialty of choice such as haematology and blood transfusion. The programme is a mixture of theoretical course work, module by module, (table 1) bench practicals undertaken in the laboratory of an adjoining tertiary hospital accredited for the training, and clinical apprenticeship under a designated supervisor.

A newly qualified Fellow in the subspecialty of haematology and blood transfusion enters professional service at the level of a Consultant Haematologist in the routine laboratory of a tertiary hospital, or a National Blood Service, or as a lecturer in a medical school. The Fellow is able to function well professionally at any of these positions.

Thus with the regular output of Fellows from the Colleges, as shown in Table 2, there should be no shortage of specialist personnel to work in the blood services in Anglophone West Africa. However, the managerial skills required at this high entry point still have to be acquired on the job, as they do not appear to be well covered in the fellowship training programme.

ACADEMIC POSTGRADUATE TRAINING

In contrast to the Fellowship training programme an alternative route of specialization in blood transfusion or scientific graduates from the university undergo further studies to acquire a Master's degree (Msc) or Postgraduate diploma (PGD) in blood transfusion.

In West Africa, the MSc or PGD course in blood transfusion is not well developed, being offered in only one or two centres, such as in the College of Medicine of the University of Lagos, according to information supplied by the Head of Haematology department². In other parts of Africa also, only few centres offer the MSc or PGD course in blood transfusion science. Examples are Tunisia³, and South Africa⁴. The notable benefits of the academic postgraduate are two-fold. It prepares the candidates better for an academic career, and also promotes improvement of research capacity in blood transfusion.

This is part of the objective of the T-REC programme sponsored in Africa by the Liverpool School of Tropical Medicine and Hygiene, in collaboration with the Africa Society for Blood Transfusion (AfSBT)⁵.

The MSc or PGD programme is yet to make significant impact in the management of blood services in Africa.

TRAINING OF MEDICAL LABORATORY SCIENTISTS IN BLOOD TRANSFUSION SCIENCE IN NIGERIA

Historical Perspective

Training in Medical Laboratory Science (MLSc) in Nigeria was an offshoot of the system in Britain, the former colonial master. The training consisted of a five year programme in two parts; Intermediate and Final. The intermediate level was a 3 year training in all the disciplines of pathology, while the final 2 years took up training in one discipline of choice such as haematology and blood transfusion science (BTSc).

At both levels, hospital laboratory postings were sandwiched between classroom lectures and practicals. Initially, the intermediate training was done in Nigeria, while successful candidates travelled to England for the Final training.

When the Institute of Medical Laboratory Technology of Nigeria (IMLTN) was established by decree 56 of 1968, that body took over the control of the profession of Medical laboratory science in Nigeria including the training and certification of the professionals. However, the final training of the medical laboratory scientists continued to take place in England until in 1971 when the IMLTN introduced a 4-Part (1,2,3 and 4) training programme, leading to the award of what was called the Associate of the IMLTN or AIMLT. In that programme, BTSc was taught in the latter parts (3 and 4) of the programme.

A fellowship programme was later introduced in which Associates could study to become Fellows either by course work, which was essentially a repeat of parts 3 and 4 in a different subspecialty of pathology or by project and thesis.

Meanwhile, the IMLTN went through a series of reorganization until in 2003, it assumed the present name of Medical Laboratory Science Council of Nigeria, MSLCN. The Council, by legislation now performs both certification and regulatory control of the medical laboratory science profession⁶.

CURRENT TRAINING IN MLSc IN NIGERIA

MLSc training by Associate system continued until 1980 when two universities, and in 1983, two others, introduced a 4-year degree programme leading to the award of Bachelor of Medical Laboratory Science, BMLS, qualification. Then in 1987, the MLSCN developed a 5-year harmonized programme in MLSc training which was approved by the National Universities Commission for all universities offering a first degree programme in MLSc⁷.

Entry requirements for the BMLS are, at least credit passes at WASC or GCE O'Level, in English language, mathematics, chemistry, biology, and physics. Prospective candidates also have to pass a common entrance examination called the Unified Tertiary Matriculation Examination, UTME, without which, unless exempted nobody can be admitted into undergraduate studies in Nigeria.

In the first year of the 5 years BMLS programme (100 Level) students study advanced mathematics, chemistry, biology and physics and at 200level (second year) they study the basic health sciences like anatomy, physiology, biochemistry and pharmacology. The 3rd, 4th and 5th years are devoted to laboratory studies in blood transfusion science.

The programme in the 5th year includes a mandatory research project to be conducted, written up and defended. With about 20 universities now offering the BMLS degree programme, the associate programme has been discontinued in Nigeria. A few universities are now beginning to offer postgraduate courses in MLSc up to the Masters and Doctorate Levels.

THE ROLE OF THE MEDICAL LABORATORY SCIENTIST IN BLOOD TRANSFUSION PRACTICE

A qualified medical laboratory scientist in the BTSc specialty is expected to possess and demonstrate the following abilities;

1. Knowledge of the serological characteristics of all blood group systems and their clinical importance.
2. Proficiency in all laboratory procedures for the serological and microbiological safety of blood.
3. Preparation and standardization of antisera and other reagents used in blood transfusion processes.
4. Proficiency in blood donation procedures, and the transportation, storage and processing of blood and blood components and products.
5. Resolution of abnormal and adverse events, and medico-legal issues in blood transfusion practice.
6. Knowledge of quality management systems (QMS) and assurance, and good manufacturing practices in the blood transfusion laboratory.
7. Knowledge of automation and the use of blood enterprise computer systems (BECS)
8. Knowledge of the immunology of haemopoietic stem cell transplantation and the laboratory procedures in the process.

With these competencies assured, the training of medical laboratory scientists in Nigeria provides personnel that can function effectively in the purely laboratory aspects of any blood service or hospital department of blood transfusion.

Training in Blood Transfusion at the Technical Level

In 1985, the MLSCN introduced a 3 – year training programme in medical laboratory science, leading to the award of the medical laboratory technician certificate⁸ Entry requirements are slightly lower than for the degree programme and the course content less intensive.

Medical laboratory technicians are expected to assist, and be supervised by registered medical laboratory scientists. A medical laboratory technician may be admitted into the BMLS degree programme at the second year (200) level provided entry requirement deficiencies are remedied.

In-Service Training in Blood Transfusion practice

On the job training of laboratory personnel of various cadres in blood transfusion practice has been made available in Nigeria for several years by the Safe Blood for Africa Foundation (SBFAF) with funding from PEPFAR, a programme of the United States of America.

This training which is often held in the blood transfusion laboratory of the hosting institution, is aimed at improving the proficiency of personnel, and updating workers knowledge of standard and best practices in blood transfusion procedures. However, with the progressive cutback in donor funding this service may not be sustained for long.

TRAINING OF NURSES FOR BLOOD TRANSFUSION SERVICE

Nurses are a key component of the team for the practice of blood transfusion all over the world. Nurses work in the blood services most commonly in the areas of donor recruitment and management and in the administration of blood and blood products in clinical settings.

In Anglophone West Africa, there are two routes for nursing training. The major one is in schools of nursing attached to tertiary hospitals. Trainees enter with WASC or GCE O'level, and spend 4 years to qualify as State Registered Nurse (SRN), and may spend another one year to add on, the qualification of State Registered Midwife (SRM). These qualifications are registrable with the Nursing and Midwifery Council of each country. The Council is the authority set up by Government to regulate the Nursing Profession. In the Nursing School training programme, classroom work is closely integrated with bedside clinical training.

The second route of Nursing Training is in the Universities. Trainees enter with good pass in UTME, and credit passes in English language, mathematics, and some core science subjects, and spend

4 years to qualify with BSc Nursing. During the 4 year programme, trainees are intermittently posted to affiliated tertiary hospitals for clinical nursing training.

Although the BScN system may impart wider scientific knowledge to the trainees than in the nursing school system, the integration of theoretical knowledge with clinical proficiency may not be as close. The places for University nursing training are few, but the system is still preferred by the more brilliant students for one reason. The establishment system in a country like Nigeria, places greater premium on any university qualification for employment rating, than a non-university qualification even though the university graduate may not be as well trained professionally as the non-university graduate.

Nonetheless, graduates of both systems are required to register their qualifications with the Nursing and Midwifery Council before they can go into employment in hospitals and clinics as general nurses.

In Nigeria, to equip nurses with skills to work better in specialized nursing areas, the Council has created a special training scheme called the "post-basic nursing programme". The specialized areas of nursing for which this programme trains nurses include nephrology, oncology, neonatology, theatre nursing and others.

Places for post-basic nursing training are very few, because the accreditation conditions are very stringent. While the general nurse may acquire these specialist skills over time on the job, the post-basic qualified nurse is equipped to go straight into specialist nursing service and the qualification is recognized for enhanced career progression in the nursing services. As desirable as it is, post-basic nursing training in blood transfusion is not yet well developed even in Nigeria, the most advanced of the Anglophone West African countries.

DISCUSSION

Medical doctors, nurses and medical laboratory scientists who can work in blood transfusion services are not scarce in Anglophone West Africa, particularly Nigeria. These professionals are well trained in their own specific disciplines.

However, because a blood service is a multi disciplinary set up where different professionals must work harmoniously and seamlessly together vein to vein, for effectiveness, it is desirable that one set of professionals should know something about the role of the other

sets of professional in the service. This is particularly so for those in managerial or supervisory positions. This concept of integration seems to be lacking in the training of personnel for blood transfusion services.

There is also the issue of other ancillary personnel outside the three major professional groups. These include blood donor organizers and recruiters and phlebotomists. From the evidence in this survey there is no specific system of training for this group and their position in the career schemes of service is not clearly established

RECOMMENDATIONS

National blood services, with assistance from regional and /or continental AfSBT, should design a training scheme for blood donor organizers, recruiters and phlebotomists, and other ancillary personnel. National blood services should also sensitize and pressurize their Ministries of Health and other relevant authorities to recognize and place on appropriate schemes of service this category of blood transfusion workers after successful training.

An integrated training scheme for intending entrants into the blood service is highly desirable. Doctors, nurses and medical laboratory scientists may be admitted into this training for a period of say, six to nine months. The training course should be service oriented, preferably outside the university system and should lead to the award of a certificate which may be called the post basic certificate in blood transfusion.

The curriculum may be set in modules such as the clinical module, the technical module, the quality module, the marketing and human relations module, and an organization and management module. Participants may be exempted from the module of their primary or basic training. The certificate should be registrable with the Health Professions Authority of each country, and should count for career progression.

While the full course is being developed a shorter version of it lasting say 4-6 weeks, may be designed, without certification, as an orientation course for new entrants into blood services.

The AfSBT, perhaps through its education committee, may help to develop these ideas to be sold to national blood services for implementation.

A survey, similar to the one reported here may be conducted in other Regions of AfSBT to provide a continental perspective.

Table 1: Transfusion Medicine and Haemolytic Disease of the Newborn

S/N	Topic
1.	The Blood Bank: organization, infrastructure & basic equipment, counseling room, bleeding room, donor resting room
2.	Blood Donor Organisation: donor organisers, phlebotomists, types of blood donors, donor care
3.	Donor blood screening for transmissible infections: HBV, HCV, HIV, Syphilis, etc.
4.	Medical screening of blood donors; Bleeding room procedures
5.	Grouping antisera: sources; avidity; antigen/antibody reaction enhancing agents
6.	Laboratory procedures: ABO and Rh blood grouping (Tile and Tube techniques); antibody screening, direct and indirect anti-human globulin tests, Cross matching;
7.	Laboratory procedures: Component preparation, red cell concentrates, fresh frozen plasma (FFP), frozen plasma (FP), platelet concentrates, cryoprecipitate, etc.; indications for component use
8.	Clinical transfusion practice: checking of donor/recipient data at bed side; hazards of blood transfusion, investigation and management of transfusion reactions
9.	Red cell substitutes
10.	Parentage dispute and blood group serology
11.	Haemolytic disease of the newborn (ABO, Rh, others): diagnosis and management
12.	Laboratory safety and quality assurance in transfusion practice.

Table 2: New Fellows, by year in the last 10 years, in the Haematology and Blood Transfusion specialty of the National Postgraduate Medical College of Nigeria (NPMCN)

Year	Number of New Fellows	Year	Number of New Fellows
2008	9	2013	2
2009	1	2014	10
2010	5	2015	17
2011	8	2016	15
2012	8	2017	17

Source: *Academic Registrar's Office, NPMCN, 2018.*

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