Case Report

Development of Medical Technology-Clinical Laboratory Sciences programs: Four decades of progression.

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Introduction:
Late 1960s and early 1970s saw substantial growth and development of large hospitals, medical centers, and Pathology laboratories in Pakistan, stipulating acute requirement of qualified technical personnel. Moreover, number of qualified specialist and doctors trained in various fields of Pathology and Clinical laboratories also grew due to the availability of recognized training centers within the country, in addition to those coming from abroad, causing even more consciousness among the health care community for the need of the same to manage and assist laboratory technologies. It was then deliberated that medical laboratory technologist or clinical laboratory scientist, recognized world-wide as a key player on the health care delivery team (1-4), therefore needed to be trained and get qualified in such a way that, not only they can carry out the expected responsibilities, but also able to manage various aspects of a laboratory and develop skills for improvement of services. To get qualified, certain levels of programs are at choice, starting from certificate courses after intermediate upto bachelor’s and master (M.Sc) levels of medical technology programs in clinical lab sciences. A bachelor’s degree program in Clinical Laboratory Science can prepare students for clinical lab scientist jobs. The undergraduate degree program teaches students how to perform diagnostic lab tests for physicians to use to diagnose and treat patients. Students learn how to test fluid, blood and tissue specimens while operating complex lab equipment. An undergraduate degree program in Clinical Laboratory Science prepares students to take the national certification exam by the National Accrediting Agency for Clinical Laboratory Sciences, which can provide more employment opportunities. People with a bachelor’s degree in Clinical Laboratory Science work in, hospitals, clinics, private laboratories, pharmaceutical companies (directory.org accessed on 11/02/13)

Degree and Diploma programs-CLS: The foremost program introduced in early 1970s to train personnel for laboratory services was the two years bachelors’ (baccalaureate) medical technology (MT) at Basic Medical Science Institute (BMSI) at Jinnah Postgraduate Medical Centre, Karachi, recognized by state/government university (University of Karachi). The program and the curriculum were designed in similar pattern to those available at that time (and still are) in American universities. The courses includes all aspects and fields of pathology laboratory viz hematology, clinical chemistry (biochemistry), microbiology, histology, elementary anatomy, micro-techniques, serology, parasitology and blood banking. The batches, that follows for one and half decades not only includes those who came to get professional degree and than get better employment but also a considerable number of candidates that were already employed in public sector health institutes and needs upgrading or required to do so by their departments. The program was running with above 70% passing average but unfortunately abandoned due to lack of funds. Those enrolled during that period were enthusiastic lot, greatly involved in long hours of theoretical and practical work, made to superior positions after passing, even to supervisory and also as specialist technologist in several cities in USA and UK. Seeing the success of MT program at BMSI, Karachi and understanding the need of trained personnel in this field, several other medical institutes
in Karachi and other parts of the country also followed the same path and introduced similar programs. Presently around half a dozen institutes and medical centers all around the country in major cities are successfully running MT programs both affiliated with state universities or private ones, including Baqai Medical University, Ziauddin Medical University, Dow University of health sciences and SIUT. However ending of MT program at BMSI, Karachi, which deals with the major share of aspiring trainee technologist, was a disappointment for those craved for better training opportunities in this field and caused hardship for those pursuing the carrier in the city.

Upgrading and advancements: In early 1980s, department of Pathology laboratory services, Liaquat National Hospital (LNH) Karachi, which was then expanding its laboratory services, also realized the dire need of trained staff and dearth of it, and therefore introduced an indigenous, two-year certificate laboratory technician training program (referred exactly the same in USA and UK). The curriculum was a combination of both theory as well as practical aspects of pathology laboratory services inclusive of phlebotomy and laboratory management. Within nearly two decades (1982-2001), through this particular program, around 150 technicians were trained, passed, got employment within LNH (around 50%), and also proceeded to other institutes, both public and private. Some of them got chances to go abroad and since then serving at technical posts. Of those employed within LNH, some continued to study (part-time) and added baccalaureate and master’s degrees in biological sciences to their educational status and thus became senior technicians or supervisors. Parallel to this certificate course, in early 1990s, the faculty of department of pathology and the management of LNH had envisaged yet another problem or need in this field, the need for the availability of diagnostic laboratory-specific technologist, with higher degree cadre, who could undertake not only patients’ counseling, customers satisfaction, but also get involved in extensive quality control management, research and development tasks. The experts within the department and educationist from state university of Karachi, after much discussion and deliberation, prepared a two years curriculum of postgraduate diploma status, parallel to its American and European counterparts, in terms of detailed exercise of laboratory organizations, management, instrumentations, advanced diagnostic techniques, biostatistics and biology of diseases, in addition to the usual existence of related pathology subjects. The program was designated as postgraduate diploma in diagnostic laboratory sciences (PDG-DDLS) and initiated in 1991. The program was developed for those possessing graduate degree in MT or with subjects in biological sciences. Distinctly, PDG-DDLS program was, distinctive in its category and available only at LNH, affiliated with University of Karachi (5). Thus those who needed training therefore either came to LNH either for certificate technician course, or those with graduate degree got enrolled for PDG-DDLS, or got enrolled in other MT programs of Clinical lab at other institutes. In the mean time, we at department of pathology lab services, LNH, analyzing the need of graduate level training in CLS/DLS specialty, decided to revive the program of baccalaureate MT. Thus standardizing and upgrading the old version of MT program with present day technologies and curriculum, in assistance with educationist from University of Karachi, we introduced Bachelor’s of science (B.Sc) program in MT-Clinical Lab Sciences in 2003 at LNH. Bachelor of Science in Clinical Laboratory Science programs provide students with education in lab sciences. The graduates of bachelor’s programs are qualified for medical technologist or clinical lab technologist careers, or they may choose to pursue educational status (Educational Portal 2013, accessed on 11/02/13). Since then several sister institutes also followed in our footsteps and got affiliated with same program from state university such as SIUT. In 2006, as per instruction of Higher Education Commission (HEC), universities decided to upgrade their two years BSc program to four years BS program by introducing clinical practicum and several other advanced levels of course work related to clinical lab sciences. After
the introduction of BSc in 2003, and subsequent upgrading to BS in 2006 till present year, around 60 trainees graduated in MT-CLS, thus ensuring the availability of considerable number of trained technologists for rapidly expanding local health care sector in the country.

Developments: If we look around the country and compared it with the level of facilities available abroad, we have come a long way. Several policy and developmental studies carried out during last two decades by experts and specialists abroad in the field of MT/CLS pointed out many similar and related facts (6,7), factors (8,9), developments (10-12), achievements (13, 14) and failure (15), as faced by us. The most significant mention is the series of articles authored by Koltarz (1-3, 13), which detailed the need, foundation and the development of MT/CLS program in USA during 1945-1977. Conclusion of Kotlarz's review and studies indicated advances in scientific and medical knowledge and the development of new technologies and significant roles for MTs (1,2).

Furthermore, the author also noted the increase in involvement of senior medical technologist and supervisor, during 1960s and 70s, in higher management functions (13). We have also noticed similar pattern of engagement of medical technologist becoming chief-technologist, supervisors and managers.

Agha Khan University Hospital was the 1ST institute that implemented this model in laboratory at a larger scale. In last decade is the development of professional competencies and administrative skills in medical technologists is also the subject of many studies, reasoning the link between professional development and medical laboratory technologist's occupational commitments (16). Nonetheless, MT/CLS programs, either our own, or those available in any part of the world, are a significant entity, not only for producing trained human resource to sustain and properly manage better laboratory services, but also for the development of this particular specialty for achieving short and long term goals and missions, thus moving forward and opening all possible future prospective for the technologists, laboratories and health care units and more importantly for the patients.

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