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Establishing Bio-bank in Nepal

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ABSTRACT

Globally, the establishment of bio-banks began around 1990s when scientists felt need for collaborative researches in biomedical field. Bio-banks collect and preserve biological specimens which are provided to researchers to investigate about specific disease or treatment. In Nepal, eye bank and skin bank are only two types of bio-banks currently in existence. However, specimens collected in these bio-banks are used only for medical treatment, not for research. With this regard, there is urgent need to establish bio-banks in Nepal. In this article, we aim to provide insights on current status of bio-banking and its benefits for scientific development of Nepal.

Keywords: Bio-bank; eye bank; Nepal; skin bank

INTRODUCTION

Bio-banks are collections of biological specimens (such as blood, tissues, body fluids, etc.) and their accompanying data.[1] Although bio-banks can be established from any organisms, however, this article will only take into account of human samples. Bio-banks are institutions that collects, stores, processes and uses biological specimens and associated epidemiological data from human beings and provides these materials to researchers.[2] Researchers use these samples for investigating specific research questions through systematically designed experiments. The global concept of establishing bio-banks emerged among scientific community around 1990s. The first initiative in Nepal to formally collect human tissues was started by Dr. Sanduk Ruit who started using the tissues for corneal transplantation.[3]

GLOBAL DEVELOPMENT OF BIO-BANKING

Currently, several countries in Europe and America have established bio-banks of large volume of human samples. Funding for establishing and maintaining these bio-banks usually comes from the respective government. National Bio-bank of Korea (NBK) is one of the largest biorepositories in Asia which was established by the Government of Korea in 2008. NBK contains bio-specimens (such as DNA, serum, plasma and lymphoblastoid cell line) from 500,000 people and provides these specimens to researchers.[2]

INITIATIVES OF BIO-BANKING IN NEPAL

Dr Sanduk Ruit established Nepal Eye Bank in Kathmandu (now a part of Tilganga Institute of Opthalmology) in 1996 with the support of Tissue Banks International. Initially, Nepal Eye Bank collected cornea from the deceased persons from the hospitals but later, they started harvesting cornea after death at the cremation site of Pashupatinath Temple.[3] Until now thousands of people have gained eye sight from the cornea transplantation. Although the corneal tissue collected was only used for treatment of blindness, this was a landmark achievement in the field of tissue banking in Nepal.[4]

More recently, Nepal Skin Bank was established in 2014 with the purpose of treating the burn patients utilizing the skin collected from the healthy donors.[5] Within five years of establishment, substantial number of burn patients have received skin allografts and recovered their injuries. Skin from the donor has to be collected as soon as possible after the death of the person. For collection of skin tissues, technicians use a special device called “dermatome” and the tissue is immediately placed in 50% glycerol solution, chilled in ice and transported to hospital for further processing and preservation.[5] Besides tissues being used for medical treatment, their utilization in scientific research has not been started in Nepal. Furthermore, little discussions are seen among Nepalese scientists and governmental bodies to initiate tissue banking for research.

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CURRENT STATUS OF BIO BANKING IN NEPAL

In Nepal, organs or tissues collected from the human donors have primarily been used for transplantation surgeries. Notably, Government of Nepal drafted a policy "Human Organ Transplantation Regulation 2073" that regulates organ transplantation in Nepal.[6] However, governmental policies and regulations regarding scientific utilization of human originated samples have not been developed in Nepal. The work of the skin and eye banks signifies the importance concept of developing "BIO-BANKS" to store biological specimens that can be utilized for human welfare. Similarly, we felt the necessity to conceptualize tissue banking and developing the standard operating protocol for the use of tissues in various researches in Nepal. We think this kind of discussion should be initiated in national scientific forum. Moreover, this kind of initiative should be taken by governmental bodies such as Ministry of Health and Population and universities with proper consultation of scientists and experts.

NEED, FEASIBILITY AND ASSOCIATED ETHICAL ISSUES OF BIO-BANKING

Our neighbouring country India has already set up tissue banking by establishment of Tata Memorial Hospital tissue bank for cancer research.[7] Given the growing burden of non-communicable disease such as heart disease, cancer, diabetes, Alzheimer's disease, etc in Nepalese population, long term effort to fight these conditions is needily essential. By utilizing biological specimens (eg. heart, brain, pancreas, blood, tissues, etc.) collected from the donors, genetic and epidemiological studies can be conducted which could produce evidence for the benefits of people. Thus, produced evidences may provide important guidance to the health care providers, policy makers and pharmaceuticals. However, paving the way for bio-banking can be impeded by many obstacles such as lack of funding and skilled manpower, limited laws and regulations and lack of plans. Furthermore, collecting human specimens and associated data is accompanied by ethical issues, privacy of data collected, data access, informed consent and intellectual property rights.[2] More importantly, different cultural and religious beliefs and traditions in the society further makes people reluctant to donate their specimens.

CONCLUSIONS

The above mentioned limitations can be addressed by holding larger level multidisciplinary stakeholder's consultations, which may provide way forward for the emerging biomedical researcher of Nepal. We greatly believe that Nepalese scientists working inside Nepal and overseas may contribute to this kind of innovative work that could provide appropriate platform for initiating bio-banking in Nepal.

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