KYOTO UNIVERSITY HOSPITAL

Signing Ceremony (October, 2017)

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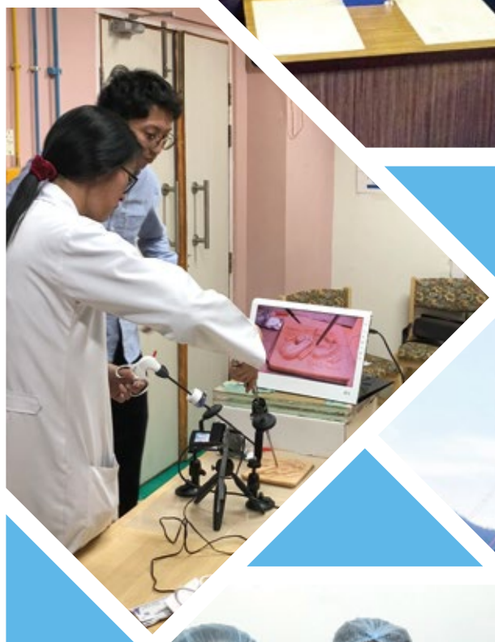
Report of the Medical Exchange Activities in Bhutan

2017 - 2018



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Project overview

In October 2013, Kyoto University Hospital concluded a medical exchange agreement with the Bhutan Ministry of Health and the University of Medical Science of Bhutan to develop young doctors in Bhutan. Based on this agreement, we dispatched about 70 medical staff members including doctors, nurses, technicians and nutritionists to Jigme Dorji Wangchuck National Referral Hospital (hereinafter referred to as "JDW Hospital"), which is the flagship hospital of Bhutan, for 3 years following the agreement to provide medical support and participate in international exchanges.

The agreement expired after 3 years, but there was a lot of positive feedback in Bhutan that the dispatch of medical staff from our hospital has been very beneficial to improve the medical situation in Bhutan. To continue with this project, the agreement involving the four parties of Kyoto University Hospital, the University of Medical Science of Bhutan, the Bhutan Ministry of Health, and JDW Hospital was renewed. The signing ceremony was held at the University of Medical Science of Bhutan in October 2017, and we resumed the dispatch of our medical staff to JDW Hospital. Based on the agreement, we are mainly performing the following three activities:

① Dispatch of medical staff including doctors as requested by Bhutan
② Assistance with the development of a specialized residency program through clinical practice
③ Instruction on public health and how to use medical equipment to improve the medical environment in Bhutan

Medical staff members dispatched from Kyoto University Hospital to conduct medical activities in Bhutan, with its national philosophy of "Gross National Happiness (GNH)," have obtained valuable opportunities not only to contribute to the improvement of healthcare in Bhutan, but also to review the practices in Japan through medical care with limited medical equipment and to think about "what is happiness."

Signing ceremony

Activities performed from 2017 to 2018

As mentioned above, we sent medical staff to JDW Hospital from October 2017 to December 2018, including specialists in diabetes, endocrinology, nutrition, hematology, gynecology and pediatrics, which have been highly needed and requested in Bhutan, based on the renewed agreement. JDW Hospital, where our hospital staff team is performing medical assistance activities, is located in the capital city Thimphu. This hospital is the largest general hospital in Bhutan and has 381 beds, 20 departments and approximately 80 doctors. It is adjacent to the University of Medical Science of Bhutan and also functions as an educational research institution where residents, interns, and nurses are receiving training.

The following members were dispatched to JDW Hospital for medical assistance from October 2017 to December 2018. For details of the activities, please see the reports by the dispatched staff on the following pages:

	Period	Name	Title and department
Team 8	October 7 to 18, 2017	Tsukasa Baba	Associate professor, Dpt. of Obstetrics and Gynecology
	October 7 to November 4, 2017	Daisuke Taura	Program-Specific Assistant Professor, Dpt. of Diabetes, Endocrinology and Nutrition
		Kanae Asai	Registered dietician, Dpt. of Metabolism and Clinical Nutrition
	October 28 to November 25, 2017	Junji Fujikura	Assistant professor, Dpt. of Diabetes, Endocrinology and Nutrition
		Hanako Yamauchi	Nurse, Nursing Department
Team 9	February 5 to 22, 2018	Junya Kanda	Assistant professor, Dpt. of Hematology and Oncology
	February 17 to March 3, 2018	Takashi Miyoshi	Program-specific assistant professor, Dpt. of Hematology and Oncology
	February 5 to March 3, 2018	Yurie Omae	Nurse, Nursing Department
	March 18 to 25, 2018	Tsukasa Baba	Associate professor, Dpt. of Obstetrics and Gynecology
		Masumi Sunada	Chief physician, Obstetrics and Gynecology, Mitsubishi Kyoto Hospital
Team 10	November 25 to December 15, 2018	Hirofumi Shibata	Clinical fellow, Dpt. of Pediatrics
		Shoko Matsuyama	Chief nurse (Surgery), Nursing Department
		Hisako Harada	Deputy chief nurse (CCU), Nursing Department

Department of Diabetes, Endocrinology and Nutrition

Non-Communicable Diseases (NCD) prevention measures are listed as one of the main issues in the healthcare field of the 11th Five-Year Plan (2013 to 2018). According to the Annual Health Bulletin 2017 issued by the Bhutan Ministry of Health, however, the increase in lifestyle-related diseases is remarkable, and the number of patients with diabetes increased from 4,097 patients in 2012 to 12,120 patients in 2016, while the number of patients with hypertension also increased from 27,023 patients in 2012 to 30,260 patients in 2016.

At JDW Hospital, outpatient medical care for lifestyle-related diseases is provided twice a week on Tuesdays and Thursdays, but there are no specialists in this field. Dr. Taura and Dr. Fujikura improved the care of patients with diabetes at JDW Hospital by teaching and advising local doctors concerning hospitalization for glycemic control and enforcement of diabetes screening, and by giving lectures to local nurses on diabetes care while providing diabetes care at the outpatient department to learn about local practices.

Department of Metabolism and Clinical Nutrition

Ms. Asai, a nutritionist of Kyoto University Hospital worked with nutritionists at JDW Hospital to improve the hospital food service, implement nutrition management with the aim of introducing an NST (Nutritional Support Team), and enhance nutritional guidance materials for patients with lifestyle-related diseases.

Department of Hematology and Oncology

In March 2017, Professor Takaori, the director of this department visited JDW Hospital for a preliminary inspection of the medical treatment of blood diseases. There are no hematology specialists in Bhutan. Many patients with hematological disorders have been hospitalized at JDW Hospital, but they do not undergo appropriate examinations and do not receive adequate treatment. In February 2018, Drs. Kanda and Miyoshi gave lectures and trained residents as well as hematology test technicians while providing medical care in the ward and outpatient clinic of the Department of Hematology. The specialized guidance to residents and technicians enhanced the level of clinical practice for hematological disorders and improved the protocol of the department performing hematology tests. On the other hand, it was found to be difficult to make a diagnosis of hematopoietic disorders in many cases at JDW Hospital. At JDW Hospital with its serious shortage of doctors, it is necessary to improve the techniques of the technicians to ensure accurate diagnoses. We therefore decided to invite two technicians of JDW Hospital to our hospital and provide training on flow cytometry and microscopic visualization of bone marrow images to the technicians. If it becomes possible to make an accurate diagnosis in Bhutan, it will not be necessary to needlessly send patients to India, which will reduce the patients' burden and medical expenses.

Also, Dr. Kanda and Dr. Miyoshi continue to support the local doctors, for example by providing consultations on medical care in the field of hematology to the residents by email, to improve the medical treatment of blood diseases at JDW Hospital.

Department of Obstetrics and Gynecology

Dr. Baba took part in ward rounds and surgical tours to learn the actual conditions and needs in the clinical practice of obstetrics and gynecology in the hospital in October 2017. In March 2018, Dr. Baba and Dr. Sunada were dispatched to JDW Hospital. They provided demonstration and guidance on laparoscopic surgical procedures to the local gynecologists, including residents, and demonstrated that laparoscopic simple total hysterectomy is possible using the medical resources of JDW Hospital. They also gave lectures on techniques and anatomy specific to laparoscopic surgery to deepen participants' understanding. In response to a request from Bhutan to dispatch gynecologists to provide guidance because the surgical instructions provided by our gynecologists had been very useful, we are sending gynecologists there again to provide guidance on laparoscopic surgery in February 2019.

Department of Pediatrics

Dr. Shibata (specialty: immunology and allergy) provided guidance on the management of atopic dermatitis and the response to food allergies at the outpatient department as well as ultrasonography to the local doctors and residents, while providing on-site medical treatment in the pediatric ward and PICU of JDW Hospital and attending ward rounds. He also gave specialized lectures in response to a request by the residents and discussed points to be improved with local doctors, in reference to the contents of the residency program.

Department of Nursing

Ms. Yamauchi and Ms. Omae were dispatched in October 2017 and February 2018 respectively to provide training on easy-to-master nursing procedures to nurses and nursing students at JDW Hospital while working in the wards of their own specialties.

In December 2018, two instructor-level nurses were dispatched, and they practiced nursing management and care with the local nurses in the operating room and ICU. In view of the points to be improved they noticed while getting to know the actual situation, they gave two lectures ("measures against infections in the operating room" and "importance of early interventional rehabilitation in the ICU") to the local nurses and doctors. After the lecture on measures against infections in the operating room, the issues of "enlightenment on hand hygiene," "introduction of a one-footwear system," and "development of a day leader supervising operation management" were addressed using the PDCA cycle.

Period October 7 to November 4, 2017

Program-Specific Assistant Professor, Dpt. of Diabetes, Endocrinology and Nutrition

Daisuke Taura

Activities

- Providing actual medical care in the lifestyle-related diseases outpatient clinic and the medical ward of JDW Hospital
- Providing guidance, advice and lectures to local physicians and nurses
- Understanding the food service system at JDW Hospital and improving related issues (assisting with activities of the nutritionist Asai)

Issues noticed during the activities

- Lifestyle-related disease outpatient care

Outpatient treatment at the department called "Lifestyle-related disease outpatient care" has been provided since 2007, and this department manages patients with diabetes every Tuesday and Thursday. Indeed, patients diagnosed with diabetes come from various parts of Bhutan to visit this outpatient department at JDW Hospital. About 50 to 120 patients per day form long lines in front of the outpatient booth. A total of two doctors, namely, a senior doctor and a resident provide care to these patients side by side. In effect, each resident provides medical care separately from the senior doctor. There were almost no strange or wrong points in the medical treatment provided by the residents. They said that they were making daily efforts to find answers themselves as necessary, and sometimes ask the senior doctors for advice.

Patients have to come to JDW Hospital the day before their consultation to undergo such blood tests as fasting glucose and blood glucose 2 hours after a meal, other serum chemistry exams and HbA1c if the doctor prescribed it at the previous visit. Therefore, patients who come from rural areas need to overnight in Thimphu City. The doctors could spend only an extremely short time with each patient, and their main tasks were to confirm the results of blood tests and the details of the prescription. Two dedicated diabetes nurses and a nutritionist shared the booth. To all patients newly diagnosed with diabetes, the Bhutan Diabetic Patient Handbook (which also serves as a patients' own medical record) was first handed out. A nutritionist gave them nutritional guidance, a nurse measured their blood pressure and provided instructions on self-injection of insulin as necessary. Although I thought that this was a wonderful form of team care provided at the outpatient booth for diabetic patients, I unfortunately could not see any information sharing between doctors and nurses or nutritionists while busy performing outpatient care. Only first-time patients were referred to receive nutritional consulting, and doctors did not seem to inquire about diet or referred patients for follow-up with the nutritionist. The dedicated outpatient nurses were highly informed, aware and enthusiastic, and they prepared a pamphlet on dietary guidance which was provided at the outpatient booth (see Photos 1 and 2). Nutritionist Asai improved this pamphlet so that those who do not understand English would also understand it. For more details, please refer to Ms. Asai's report. Regarding oral hypoglycemic drugs for patients with diabetes, metformin was used for almost all patients, and when the disease could not be controlled with metformin alone, gliclazide was selected as the second-line drug, and pioglitazone was selected as the third-line drug. The frequency of insulin use appeared to be lower than at diabetes outpatient clinics in Japan. In my opinion, the pancreatic insulin secretory ability of Bhutanese patients with diabetes may remain better compared with Japanese patients with diabetes.

Photo 1 Photo of specialist outpatient nurses and the nutritionist Asai

Photo 2 Poster displayed in the outpatient department with diet guidance for patients

The reports by Dr. Fujikura, who was appointed as my successor, provide details on the analysis of drugs selected for outpatients with diabetes. For example, since DPP4 inhibitors are not adopted at the hospital, patients who needed to use them had to buy the drugs themselves. DPP4 inhibitors are known to be expensive, but well-informed patients who wished to use it, purchased it from India and used it as prescribed by their doctor. No cases who used SGLT2 inhibitors, which are even more expensive than DPP4 inhibitors, could be confirmed. This seems to be closely related to the fact that medical costs in Bhutan, including drugs, are basically all free.

In addition, while actually conducting outpatient care, I soon noticed the low reliability of the HbA1c test values at JDW Hospital. I was surprised to see a patient with an HbA1c value of 40 units on the first day of my outpatient work, and was told by a local doctor that he had seen a value of 80 units, which means that the specimen examination system needs to be improved.

Many patients with hypertension as well as those with both diabetes and hypertension also presented at the Hospital, but losartan and amlodipine were predominantly used among the antihypertensive agents. In some cases, hypertension might be poorly controlled even with a combination of multiple drugs, and most hypertension patients with concomitant or non-concomitant diabetes already showed signs or symptoms of decreased renal function.

- Nutritionist activities and feeding service system at JDW Hospital, and food culture in Bhutan

Lifestyle-related diseases such as diabetes and hypertension are closely related to diet. Therefore, I wanted to see the Bhutanese food culture and diet. Typical Bhutanese cuisine generally consists of rice, cheese and red pepper. The amount of rice consumed per meal is very high, although there are individual differences. According to the data of the Bhutan Ministry of Health, the mean amount of salt consumed per day is 9 g. I actually thought that Bhutanese people consume more salt because there are many patients with hypertension, hypertension-associated cerebral hemorrhage and renal failure among both hospitalized patients and outpatients. However, a nutritionist working at the Bhutan Ministry of Health with whom I discussed the matter told me that the data of 9 g/day is reliable because the data was not only collected from people in Thimphu but also from people randomly extracted from the whole country. To ascertain this matter, I planned to estimate salt intake by measuring the urinary Na and creatinine excreted by patients immediately after hospitalization, explained my plan to Dr. Fujikura and the resident, and then returned to Japan. Unfortunately, this study could not be done after all. I also saw that people often sprinkled salt on dishes such as soup, so I strongly felt the need for activities to raise public awareness of salt intake.

JDW Hospital has a total of 6 nutritionists, including 5 local nutritionists and one Japanese volunteer nutritionist working for JICA. Ms. Asai was dispatched to join this team and also assisted with the Japanese volunteer activities. The nutritionists made enteral foods themselves and also determined the ingredients of enteral nutrition and total calories themselves. Unfortunately, the doctors at the hospital have a lower awareness of nutrition. Although there are many nutritionists, we did not see any NST or related activities. The hospital prepares only one type of meal and the patients or a family member come to a place close to the kitchen to pick up the prepared meals at specified times (Photo 3). It is said that the hospital meals are made in accordance with the recommendation of the Bhutan Ministry of Health, but only curry rice is actually provided every day and the proportion of carbohydrates is extremely high. The volume of food dished out is determined by the size of the plate, therefore, it is almost impossible to calculate the total calories. Quite impressively, the family of a patient who was hospitalized for hypertension complained that, "The hospital's meals are too salty,"

and I saw how that family actually prepared and brought low-salt meals to the patient every day. Both the calories and the amount of salt included in enteral nutrition and hospital meals per gram are ambiguous. It was concluded through discussion with Ms. Asai that it was necessary to accurately calculate these values, and she worked with other nutritionists to calculate them. These appear to be important data to subsequently improve the hospital food service and enteral nutrition feeding programs.

Photo 3 Providing hospital food

Accomplishments and results of this dispatch

- **Guidance, advice, and lectures to local doctors and nurses**
- **Providing nutritional guidance, understanding the current state of hospital food service, and improving related issues**
- **Inspecting and improving medical record and data systems**

In view of the opportunity to give daily advice regarding diabetes care and endocrine care to local doctors including residents, nurses, nutritionists, and students, I gave as much advice and guidance as I could. Having understood the importance of caring for patients with diabetes in Bhutan, where it is predicted that the disease will grow in incidence, local internal medicine doctors want to learn more and acquire knowledge about the reality of clinical diabetes in Japan and often asked our opinions. On the other hand, since no doctors are currently specialized in diabetes, daily outpatient diabetes care is conducted by busy internal medicine doctors and residents taking turns performing outpatient diabetes care, which internal medicine doctors unfortunately consider as something they would rather not engage in. For example, when I started actual diabetes treatment at the outpatient diabetes clinic, all Bhutanese doctors suddenly disappeared and I then had to face smiling patients who only spoke Dzongkha and did not understand English. I experienced such cases several times. The ideal way of improving the current situation is to develop diabetes-specialized doctors with an interest in clinical diabetes. Currently, all specialized medicine in Bhutan is centralized at JDW Hospital, which means that if Bhutanese doctors want to acquire some form of specialization, they need to undergo training at JDW Hospital. However, this also means that if JDW Hospital has only one diabetes and endocrinology-specialized doctor, diabetes and endocrine care will improve, which will promote the education and guidance of all doctors, residents, interns, and allied healthcare professionals working at JDW Hospital.

In the 1-month period, there was only one patient admitted suffering mainly from my specialty, endocrine diseases, and the patient was only suspected to have an endocrine disease. If the diagnostic level regarding endocrine diseases in the countryside does not improve, there is concern that patients will not make their way to JDW Hospital. However, there are fortunately two residents in the medical ward of JDW Hospital who are interested in endocrinology and who want to become an endocrinologist. Furthermore, in response to a request of the local nurses, a lecture regarding the nature of diabetes and the state of clinical diabetes in Japan was given, and a large number of nurses attended it (Photo 4).

Before the dispatch to Bhutan, I knew that patients would carry their medical records themselves and no data remained at the hospital. Accordingly, the objective was to inspect and improve the current JDW Hospital medical record and data systems. As of October 2017, outpatient visit records of all patients who had received outpatient care, which were recorded by nurses, actually existed. These included the patient's name, blood sugar value, birthplace, and the presence/absence of renal dysfunction. Body weight was not recorded, but after the content was discussed, it was improved.

Photo 4 Lecture

Several clinical research projects have also already started. Statisticians and nutritionists have been collaborating to create digitalized diabetes outpatient care data since several years ago. However, data are input when nutritionists skilled in data entry into the computer happen to be there, but are left out when they don't, and it is doubtful whether there are continuous data for all visiting patients. I explained to them the importance of continuing to collect continuous data.

It is difficult to understand what is written where in the ward medical records. The content on the first page may for example be test values, a summary of current medical history, or the doctor's notes of first visit depending on the patient. As preparation for emergencies, we urged both the doctors and nurses to standardize at least the first page of the medical record and provided data for a standard first page form we had prepared as an example. Patients admitted to the medical ward are also recorded in the computer when they are discharged.

However, only the name of the main disease is input, and I thus felt that more improvements are necessary to provide viable information for clinical research. However, compared to the information gathered before our dispatch to Bhutan, it is evident that advancement has currently been made in terms of the digitalization and organization of medical information.

Proposals that can be made to JDW Hospital, the University of Medical Science of Bhutan and the Bhutan Ministry of Health

When I asked many outpatients with diabetes whom I met, "How were you diagnosed with diabetes?" most of them answered that they were found to have elevated blood glucose when they visited a local clinic and underwent blood tests because they had a cold, gastroenteritis or some other health problem. It is a good thing to also evaluate the blood sugar and blood pressure at the time of a visit, but many patients tend to be diagnosed with diabetes or hypertension only after the disease has progressed to a certain extent under the current circumstances that diabetes and hypertension are detected only by chance. Ideally, it is better to organize and consolidate outpatient medical records at the current JDW Hospital and to establish an appropriate health examination system using the collected data at the national level to lead to the early detection of lifestyle-related diseases and a decrease in cardiovascular events that occurs as a result of lifestyle-related diseases, eventually leading to a reduction of public health and medical expenses. At the same time, I think it is essential to promote educational activities to improve the entire population's awareness of lifestyle-related diseases.

Currently, all outpatients with diabetes from all over Bhutan have been diagnosed with diabetes for the first time at the outpatient department of JDW Hospital. It is necessary to consider spreading medical practice at JDW Hospital to local hospitals in the future. On the other hand, conducting an investigation on diabetes and hypertension at JDW Hospital, even at one site, is enough to grasp the current status of these diseases covering all areas in Bhutan, which is a very special situation. It is necessary to confirm this point, and then to continue recording patients' medical information at the outpatient section for diabetes while refining this valuable clinical database. Especially, lifestyle-related diseases such as diabetes and hypertension are greatly related to each country's own history, customs and environment, and the Golden Standard for medical treatment of diabetes in Bhutan may be different from that in Europe, the United States or even Japan. (I explained to the resident that it is necessary to obtain Bhutan's own clinical data, even if the sample size is small. In addition, we also discussed the clinical research topic of one local resident and prepared study designs for such research as the identification of risk factors for renal failure in Bhutan to some extent.) It is essential to gather clinical data not only for daily medical practice in the clinical setting, such as diabetes and hypertension, but also for epidemiological research and therapy evaluation. It is also necessary to further discuss with the local doctors and the Bhutan Ministry of Health concerning how to prepare and store clinical data at JDW Hospital in the future.

It is considered necessary to introduce DPP4 inhibitors for the treatment of diabetes. In fact, there are many patients with diabetes who are poorly controlled with two drugs of metformin and gliclazide. However, since

currently blood IRI and CPR can only be measured with support from India, and Bhutanese patients actually show an instinctively negative reaction to insulin self-injection, it has been difficult to move to the next step in many cases. Indeed, many patients import DPP4 inhibitors individually, so in order for the clinical care of diabetes in Bhutan to improve and expand, it is necessary to prescribe DPP4 inhibitors, which have a low risk of hypoglycemia and much clinical evidence of their efficacy in Asians.

Overall impression of the present medical assistance activities

I am very grateful that I could partake in the medical assistance activities in Bhutan this time. As someone who is used to the convenience of life in Japan, I was very worried about how I would work over there and if I could live normally before the dispatch, but Thimphu turned out to be a very nice city. The country has the goal of becoming a tourism-rich nation and there were no issues regarding food or other amenities, and the diet I had planned before going there failed. Not being able to eat much fish, also raw fish, was something that I, as a Japanese, found tough.

Both inside and outside JDW Hospital, the local Bhutanese were kind and overflowing with hospitality. Due to the efforts of Dasho Nishioka as well as the activities of JICA, the sentiment towards Japanese people is very friendly. In recent years, Japanese anime (comics) has also swept over Bhutan. Almost all young nurses know the Japanese manga Naruto, and some of them have seen the film "Kimi no Na wa" ("Your Name" in English). In addition, due to the efforts of people who have been dispatched from various departments until now, the name Kyoto University has become a commonly understood word at JDW Hospital. Thanks to the dispatch activities up to the present, we were able to achieve some form of significance to our activities this time. I express my gratitude to everyone who has taken part in the dispatch activities until now. All members of the medical staff that I met at JDW Hospital were eager to learn about the newest Japanese and Western medical knowledge and technology. The nurses repeatedly requested that Kyoto University will dispatch field-specific nurses such as diabetes care instructors instead of general nurses in the future. The doctors frequently asked questions about how certain cases would be handled in Japan, giving us the feeling that continued future support from Kyoto University is desired.

Regarding the dispatch period of 1 month, I felt that it was too long simply for inspection, but too short to meaningfully get involved in local activities. Just as it became easier to put our plans into action as we have gained close relationships with the local medical staff, we already had to return home, although reluctantly.

Personally, I would gladly visit JDW Hospital and rekindle my friendship with the local medical staff with whom I became close, but also to help JDW Hospital and the newly founded Bhutan Medical College if the opportunity arises. The local nurses are tenacious and asked me to bring many SKII and anime DVDs when I return to Bhutan. While 1 month was short, I assess that I was able to interact much with local doctors and allied medical professionals and that I could support my successor, Dr. Fujikura, to begin his activities.

Finally, I would like to express my gratitude to the hospital director Inagaki, Dr. Okajima, and Mr. Yasumoto for having granted me this precious opportunity, as well as the obstetrician Dr. Baba and the nutritionist Ms. Asai for having accompanied me. With those who were dispatched with me, it truly was a blessed Team 8.

Period October 28 to November 25, 2017

Assistant professor, Dpt. of Diabetes, Endocrinology and Nutrition

Junji Fujikura

Activities

- Diabetes care and education in the ward and outpatient clinic of JDW Hospital

Issues noticed during the activities

According to the Annual Health Bulletin, while patients with malnutrition decreased from 331 in 2011 to 311 in 2015, patients with diabetes increased from 3,740 in 2011 to 12,384 in 2015, and patients with hypertension increased from 23,051 in 2011 to 34,646 in 2015, suggesting an improvement in nutritional status and an increase in patients with lifestyle-related diseases.

(1) Exclusive physicians specializing in diabetes / endocrinology / lifestyle-related diseases are required.

The Diabetes Section of the Lifestyle-related Disease Unit opens twice a week on Tuesdays and Thursdays, and about 100 to 150 patients visit the office per day.

JDW Hospital currently does not have any (exclusive) doctors specializing in lifestyle-related diseases and has only one or two residents in training and medical staff not specialized in the diseases, who take turns to see patients. The outpatient department has two nurses, who measure the blood pressure and weight of outpatients, and give guidance on insulin administration procedures. There are several nutritionists in the outpatient department, mainly providing nutritional guidance to new patients.

During the dispatch period, we provided medical care at outpatients, were consulted by local staff, and conducted various studies on outpatients with diabetes to grasp the current status of diabetes treatment.

(2) Find significance in diabetic care.

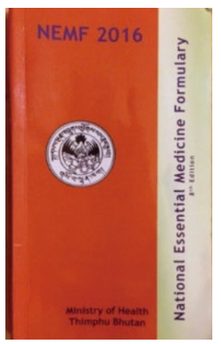
Investigation of hospitalized patients in the medical ward by disease area showed that it is a top priority to hospitalize and treat symptomatic patients with neurological diseases (stroke and epilepsy), cardiovascular diseases (angina and heart failure), gastrointestinal diseases (liver failure), renal diseases (nephrosis and renal failure), autoimmune diseases and pneumonia.

Many hospitalized patients with diabetes had end-stage renal failure. It seemed that JDW Hospital has no room for the educational admission of patients with diabetes. During this dispatch period, several outpatients were hospitalized to control their blood glucose. For patients who might be following inadequate diet therapy or be practicing a poor insulin injection technique, improvement in the blood glucose level was promptly observed after hospitalization, but some patients' disease remained poorly controlled despite hospitalization. It seemed to be better for them to continuously maintain awareness of the significance of diabetes examinations/educational admission. If the hospital has doctors specialized in diabetes and lifestyle-related diseases, there is no doubt that the care of patients with these diseases will improve.

Although 18% of patients hospitalized in the medical ward had blood glucose and HbA1c values at a diabetes level, 45% of them did not undergo tests for blood glucose and HbA1c after discharge. Blood cell and liver/kidney function tests were adequately performed, but I advised them to also perform metabolism-related examinations because they were not in the habit of conducting such examinations.

(3) Increase or update available drugs.

In Bhutan, the Department of Medical Supplies and Health Infrastructure (DMSHI) of the Ministry of Health restricts the available drugs for prescription to those on the National Essential Medicine Formulary (see below).



Anti-diabetes agents are limited to three types of oral drugs, namely, metformin, glipizide and pioglitazone,

and three types of insulin, namely, Isophane(NPH), Mixtard(Neutral + Isophane)30:70, and Soluble (Neutral, Regular), which are provided in 10 ml vials for home injection with a syringe. There are no single-use insulin injection pen or cartridge formulations, or continuous subcutaneous insulin infusion therapy or blood glucose self-monitoring systems.

The frequency of use of anti-diabetes agents in outpatients was 34% for metformin monotherapy, 22% for combination of metformin and glipizide, 15% for triple-drug combination of metformin, glipizide and pioglitazone, and 10% for insulin monotherapy. Glipizide is probably added when the disease cannot be controlled with metformin, and pioglitazone is added if it is still poorly controlled, and finally the treatment method is shifted to insulin monotherapy if all of those drugs together cannot control the disease. Some patients purchased DPP4 inhibitors at their own expense. I asked the pharmaceutical company about the circumstances under which pioglitazone is frequently used. The company answered that generic drugs made in India are imported at low prices because the drug patent has already expired.

There are many patients with diabetes leading to end-stage renal failure, but due to a lack of oral drugs such as DPP4 inhibitors, rapid-acting insulin secretagogues and α-glucosidase inhibitors with a low risk, even in renal failure patients, local doctors administered metformin, glipizide and pioglitazone at lower doses. Since insulin injections are both difficult in terms of management and treatment, they are not frequently used in patients with poorly controlled glycemia or renal failure.

(4)Increase available tests and focus on accuracy control.

For outpatient examinations, blood samples are collected on the day before the outpatient consultation day to evaluate FBS, PPBS, HbA1c, BUN, Cre, Na, K, Cl, TCho, TG, HDL, LDL, AST, ALT and CBC. Urinalysis is rarely implemented. Sometimes the HbA1c test shows unexpected outliers(3% or 40%), and the doctors do not seem to consider the results of these examinations to be accurate or reliable. Sekisui Medical's NORUDIA N has been used with DIRLICS6008 to measure HbA1c, so I asked Sekisui Medical about abnormal values, but I could not identify a clear cause. However, blood tests sometimes show considerably high K values, and the local physicians seemed to think that the abnormal values suggest issues with leaving the collected blood for some time before measuring them or the measurement method.

Patients' autoantibodies(anti-GAD antibody, anti-insulin antibody)cannot be measured in Bhutan, not even that of inpatients. Thyroid hormone can be measured in Bhutan, but samples should be sent to India to measure C peptide, insulin, GH and urinary albumin. Currently, it is difficult to select the optimum therapy based on the diagnosis of diabetes type or test results of insulin secretion ability, or to diagnose endocrine diseases or assess therapeutic effects. Since the local doctors cannot perform the examinations, even if they know about them, I felt that their motivation to gain clinical experience to perform expert medical treatment for diabetes and other endocrine diseases was negatively influenced in this situation of a lack of examinations.

(5)There is some room for improvement of glucose control.

Although blood glucose levels of all outpatients with diabetes were measured, HbA1c was not measured in 48% of patients. Among the patients whose HbA1c was measured, the percentage of patients with an HbA1c〈7% was 69%, that of HbA1c 〉7% to〈8% was 6%, and that of HbA1c 〉8% was 25%. When estimated in conjunction with the blood glucose level, 60% to 70% of patients were achieving good control and 20% to 30% of patients were poorly controlled, which suggests that there is some room for improvement of blood sugar control.

Regarding diabetes management, there seems to be enough room for improvement if exclusive doctors/allied healthcare professionals are recruited, the accuracy of examinations is increased, and other anti-diabetes agents are also newly introduced.

(6)Many hypertensive diabetic patients have advanced renal dysfunction.

Investigation of the prevalence of hypertension, hyperlipemia, renal dysfunction(serum creatinine 〉1.5) in diabetic outpatients showed that the proportion of diabetic patients with hypertension was as high as 41%, and the proportion of hypertensive diabetic patients with hyperlipemia was 29%. In addition, 17% of patients with diabetes also had renal dysfunction.

(7)Lipid is well controlled, but there is some room for improving BP management.

We examined the control status of LDL cholesterol and blood pressure in outpatients with diabetes, and diabetic patients with LDL〈120 accounted for 80%, indicating that lipid is well controlled. However, 50% of diabetic patients showed systolic blood pressure ≥130, indicating that there is some room for improvement of blood pressure control. We also found that many diabetic patients with poorly controlled blood pressure had renal dysfunction. We heard that there are many patients with renal dysfunction caused by renal sclerosis in the Kidney Outpatient Unit, and it was suggested that blood pressure control is also important as one of the measures against renal failure in diabetic patients.

Available antihypertensive agents include losartan, enalapril, amlodipine, nifedipine, atenolol, propranolol, hydrochlorothiazide, furosemide, spironolactone, methyldopa, hydralazine and clonidine.

The frequency of use of hypotensive agents in hypertensive patients with diabetes was 47% for losartan monotherapy, and 27% for amlodipine monotherapy. Among angiotensin II receptor antagonists(ARBs), only losartan is commonly used, but it seemed that improvement of blood pressure control can be expected if more powerful ARBs are adopted.

(8)Increase public awareness of weight control.

Patients hospitalized in the medical ward and their families said that 96% of the households do not have a body weight scale at home and they usually have their weight measured at school or BHU. It may be difficult for obese patients to manage their weight at home.

Accomplishments and results of this dispatch

- I was able to grasp the state of diabetes care at JDW Hospital.

Proposals that can be made to JDW Hospital, the University of Medical Science of Bhutan and the Bhutan Ministry of Health

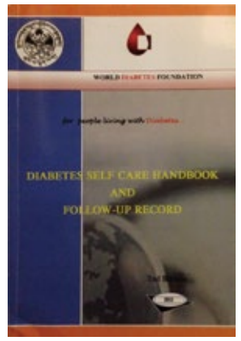
(1)Enhance the Lifestyle-related Disease Care Outpatient Unit.

As the number of patients is increasing, it is necessary to increase the number of outpatient consultations, which are currently provided only twice a week, and to recruit a dedicated doctor.

(2)Thorough quality control of blood tests is required.

(3)Expand patient data management at the hospital.

We investigated the actual situation in Bhutan while seeing patients at the outpatient unit and in the medical ward. Patients in Bhutan bring their own medical charts as shown below when visiting the clinic for management of the examination results, charts and medications. These medical records are useful for raising public awareness of their own health management. If patients bring their notebooks, including medical records when visiting any hospital, all medical staff there can grasp the medical treatment they received, but they are useless for epidemiological studies. The data including those at the first visit are partly managed at JDW Hospital, but there is a demand for further improvement of the data management system and the adoption of electronic medical records.



Overall impression of the present medical assistance activities

Nurses who came as JICA volunteers were assigned to various departments within the hospital, making JICA's presence ubiquitous. Many retired doctors and fixed-term volunteers from the US and Australia were also present and conducted education and medical care with great passion. On the other hand, as a doctor from Kyoto University Hospital, everything was very different from my usual activities and I felt that I lacked both advance preparation and knowledge.

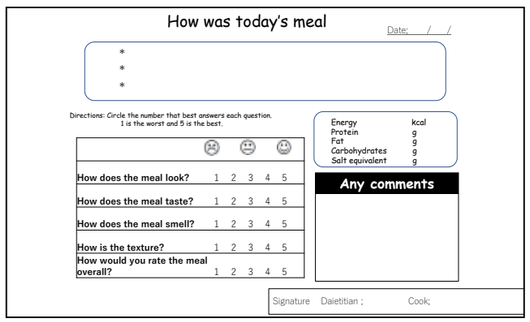
Period October 7 to November 4, 2017

Registered dietician, Dpt. of Metabolism and Clinical Nutrition

Kanae Asai

Activities

I conducted activities at the nutrition section of JDW Hospital for a 1-month period. The JDW Hospital nutrition section has existed for 10 years and currently employs five nutritionists. During my period of activity, one nutritionist was dispatched from JICA to the nutrition section to participate in the activities. The main objectives of the activities were to improve the food service, to implement nutrition management with the aim of introducing an NST(Nutritional Support Team), and to enhance nutritional guidance materials. Firstly, regarding the food service, food was made and provided in the hospital to 200 out of the 400 beds. A nutritionist prepared balanced meals weekly, but the amount of nutrients was not calculated, making it difficult to evaluate whether the patients were provided with proper nutritional composition. Therefore, the amount of nutrients was calculated based on the amount of ingredients in the hospital food. The results showed a very high carbohydrate energy ratio of over 70% and a low protein energy ratio of approximately 10%. The same trend was visible in Bhutan's general eating habits, making a transition to meals with a proper nutritional composition difficult from both cultural and ingredient cost perspectives, but improvements were suggested to come even just a little closer to realizing it. Furthermore, although a chef was cooking the food, since the amounts of seasoning and ingredients were not measured, the patients experienced variations in terms of taste and amount. Therefore, with the objective of improving the meal quality as well as staff awareness, a meal inspection system was introduced where a nutritionist evaluates and records the daily hospital meals and provides feedback to the chef(Material 1). In the future, a system will be required where the chef is able to cook dishes consisting of appropriate amounts of nutrients. While there is an issue with hygiene management in the kitchen, measures were taken as far as possible, such as ensuring that those preparing food wear hats and masks and establishing a supervisor who manages cleaning of the kitchen.

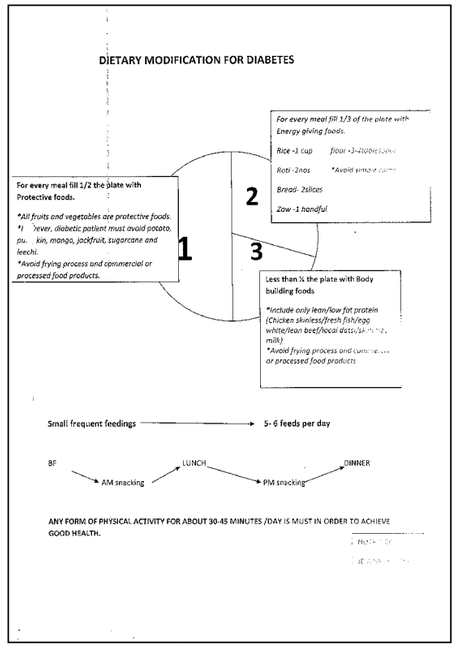


Material 1)Introduced meal inspection register

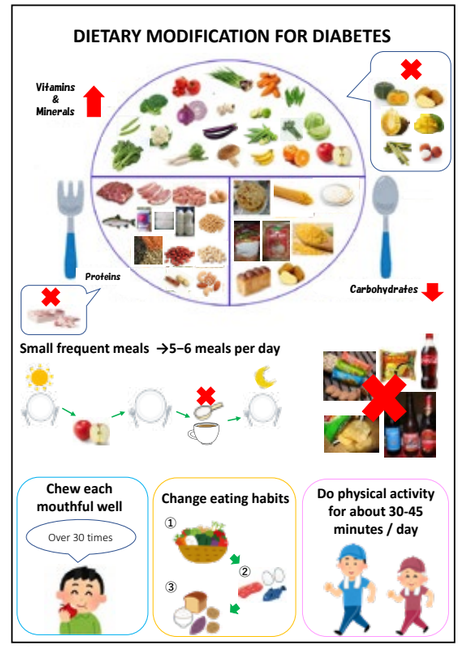
Next is nutrition management. The most frequent requests nutritionists receive from the ward concern enteral nutrition prescriptions. Upon request, the nutritionist prepared a thick liquid diet by calculating the required amount for each individual patient and adjusting the ingredients and supplements for the patient. In addition, nutritionists went on ward rounds four times a week, recording body weight and nutrition parameters on a nutrition management sheet and re-evaluating the nutritional condition of the patients. However, the currently provided amount of nutrients, as well as the matter of whether the required amount of nutrients is met or not is not recorded, and in view of the future introduction of NST, information sharing between doctors, nurses, and other medical professionals would be difficult. As such, to facilitate understanding of nutrition management for other professional staff, the nutrition management sheet was improved. Tools were also created to enable local nutritionists to easily measure the amount of nutrients for thick liquid diets.

Next is nutrition guidance. Nutrition guidance was mainly conducted for outpatients with diabetes. For diabetes guidance, shared pamphlets were used and the approach to balanced meals was explained, amongst others. The pamphlets were printed only in English and although explanations were given in Dzongkha for patients who cannot speak English, it seemed as if the pamphlets were not properly understood. The pamphlet was improved to focus more on illustrations, making it possible for non-English speakers to also understand the contents so that they can improve their eating habits at home. Opinions were exchanged with local nutritionists to create something in line with the eating habits of Bhutan. Since there are many patients with hypertension and renal diseases in Bhutan, it is considered necessary to further establish a nutrition guidance system. To this end, with efficiency in mind, pamphlets regarding hypertension and renal diseases were prepared(Material 2).

Material 2)Nutrition guidance pamphlet
For patients with diabetes

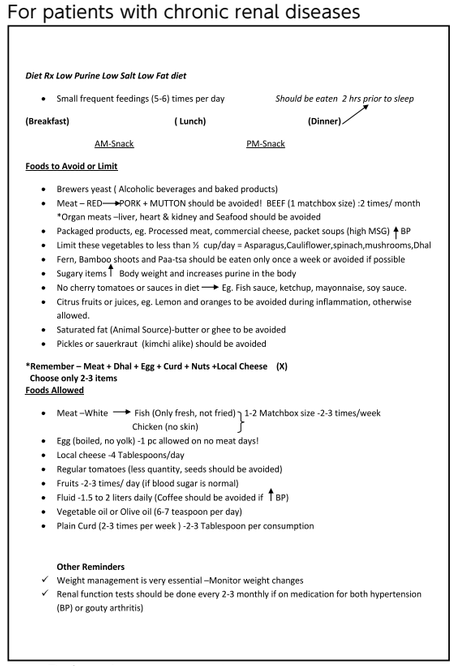


Before improvements

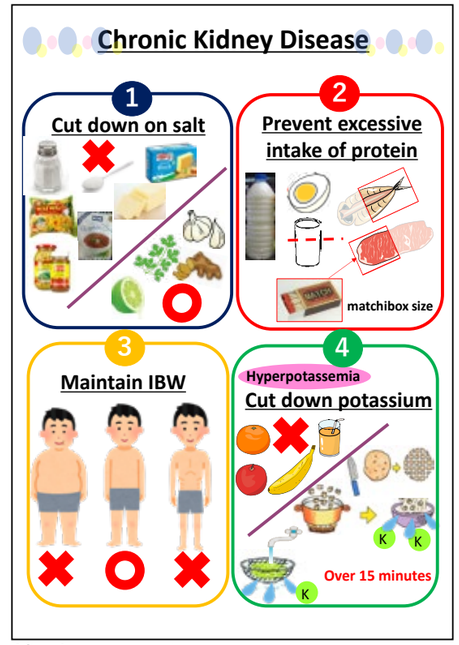


After improvements

For patients with chronic renal diseases



Before improvements



After improvements

If future improvements in each individual patient's diet could be suggested in addition to conveying the general thought behind diet therapy, patient performance may increase further.

In addition, since local nutritionists wanted to know about the current state of Japanese hospital food services, we introduced the hospital food service system and meal content of our hospital. Since it seemed as if there are few opportunities to obtain new information, they showed great interest. On request by the ICU nurses, we had the opportunity to talk about the nutrition management of renal diseases while supported by Dr. Taura of the Department of Diabetes, Endocrinology, and Nutrition.

Issues noticed during the activities

JDW Hospital currently provides a hospital food service, but only half of the inpatients actually use the service, and the others prepare meals themselves or have family members prepare meals for them. Therefore, it was difficult to grasp the content of meals and manage the nutrition status of many patients. Since the hospital service also only prepares one type of regular meal, there is an issue that patients who need consideration for the consistency of their food and those who need a therapeutic diet may not consume an appropriate diet. Local nutritionists also want to increase the kinds of hospital food that is served and provide therapeutic foods, but it may be difficult to handle the problems with the current kitchen facilities and the number of kitchen staff. It is necessary to enhance the kitchen facilities and cooking equipment and increase the number of kitchen staff.

In addition, doctors and nurses sometimes consult nutritionists about patients who have problems to manage their nutrition, but only nutritionists can determine and change the dietary amounts. It seemed that opportunities for discussions with other professionals were lacking. Although it is good that nutritionists' opinions are respected, I think that patients' nutrition can be better managed by sharing information with other professionals including doctors and nurses. In cooperation with Dr. Taura of the Department of Diabetes, Endocrinology and Nutrition, we provided opportunities for local doctors and nutritionists to discuss the nutrition management of patients with short gut syndrome. When doctors asked for their opinions, it seemed that nutritionists' motivation was increased. It would be good to further increase opportunities for team involvement in nutrition management in the future.

Proposals that can be made to JDW Hospital, the University of Medical Science of Bhutan and the Bhutan Ministry of Health

I have heard that patients with lifestyle-related diseases such as obesity, hypertension and diabetes have increased due to a lack of exercise caused by the recent widespread use of automobiles in Bhutan. For patients visiting the hospital, it seems that information and guidance systems including dietary guidance have been established, but it is necessary to take measures focused on primary preventive care in Bhutan in the future. Since nutritionists are considered to play an important role in such a situation, it would be necessary to develop nutritionists and improve their status.

Overall impression of the present medical assistance activities

I was worried about the kind of assistance I could give in Bhutan, but thanks to the warmness of the Bhutanese people and the heartfelt support of the staff, the activities were concluded without any issues. Despite having only limited access to tests and information, when local nutritionists conduct nutrition management, they perform nutritional evaluation by touching the body of the patient themselves. I learned the importance of physical assessment from them. Through the activities in Bhutan, I was also given the opportunity to consider diet therapy in light of a different food culture and values from those in Japan. I was able to once more experience how important support by a nutritionist who understands and respects the lifestyle and thoughts of the patient is, but also how difficult it is. It is something I want to remember during my future work as a nutritionist.

I am deeply grateful towards Kyoto University and the people at JDW Hospital for having granted me this precious opportunity.

Period October 28 to November 25, 2017

Nurse,
Nursing Department

Hanako Yamauchi

Activities

I was given the opportunity to engage in nursing procedures for 1 month in the surgical ward of JDW Hospital. In the beginning, since I was unfamiliar with my surroundings, I started performing daily procedures with the Bhutanese nurses to learn what kind of nursing is being conducted.

The 5S activities that the previous team performed seem to have been established in the entire hospital, and items in the surgical ward were organized in an easily understandable way. When I had time, I replenished items and keep things tidy with the nursing assistant. When seeing the staff putting away items not used, cleaning up things spread around the patient's room, or instructing families, I strongly felt that 5S had become ingrained in them. I was concerned how interested the staff was in hand washing and hand hygiene; however, during interviews, most staff and nursing students answered that they wash their hands with every procedure. This made me understand that the awareness of "1 procedure, 1 wash" was thoroughly ingrained.

5S fully implemented

As a contribution to the procedures in the ward, I made a portable pincushion. Needles used for blood sampling and securing peripheral routes had been put directly on a tray and brought along, creating a very high risk of needle sticks. While they do recognize that "needle sticks are dangerous," no measures had been established, so I reinforced the importance of the pincushion and a method to use it for continued use. I also explained the method of washing hair in bed using a Kelly pad and implemented it together with nurses and students. Daily patient life assistance is mainly performed by the family, but since they cannot really perform large-scale care such as bedside hair washing, the family also greatly appreciated the method.

As mentioned previously, daily life assistance such as hygiene maintenance and toilet assistance is mainly performed by the accompanying family. Their passionate daily care impressed me. If necessary, they would also help patients in adjacent beds. The way they looked after each other was very memorable.

Activities outside the hospital included participation in international conferences and visiting the National Institute of Traditional Medicine. It provided me with a valuable opportunity to gain new knowledge about the medical situation and issues in Bhutan and about Bhutanese traditional medicine.

Portable pincushion

Issues noticed during the activities

In the surgical ward, surgery is performed 3 to 4 days a week. An average of about 10 or up to 20 operations per day is performed. I think it is necessary to observe the general condition of patients postoperatively using a biological information monitor, but there are an absolute insufficient number of monitors. In addition, some personnel notice it when the alarm of the monitor goes off, but other personnel do not seem to care about the alarm.

The lack of monitors may be unavoidable, but I felt it necessary to improve physical assessment using the five senses including auscultation and palpation regardless of whether monitors are used or not. I think it is essential that personnel who can practice physical assessment educate younger staff.

In terms of the nursing records, there are various kinds of documents for recording including a table to record the patient's postural changes and a postoperative checklist, but it turned out that some staff members were aware of these documents, while others were not. Even once the documents were used, they were left unrecorded for several days in some cases. Therefore, it is necessary to ensure that all staff members use these documents on an ongoing basis.

Establishment of educational systems among staff and the development of leadership have been listed as challenges since before, but I felt these should remain matters to be addressed in the future.

Accomplishments and results of this dispatch

Since it was a period of only 1 month, my goals during the dispatch were to learn and experience the current situation of medicine and nursing in Bhutan. I learned that the activities implemented by the previous team are continuing, and although there is less equipment than in Japan, nursing care is performed through clever ingenuity.

I was also able to instruct the families of patients in the importance and methods of postoperative postural changing. In the beginning, I asked them to assist me every time I made a 2-hourly patient checkup. However, the family gradually started asking me for assistance, turning postural changing into a habit. This time I gave individual instructions, but it might have been more effective if it could have been conducted as group instructions.

Overall impression of the present medical assistance activities

Since the dispatch only lasted a short period of 1 month, I was worried and felt pressure about what I could achieve. However, the staff, patients, and families were all amiable, accepted me as a nurse, and with their support, my time there went by without any issues. As I was washing the hair and bed-bathing the patients together with the staff and watched how they carefully washed the patients, I realized how I in Japan performed care constantly pressed for time. It gave me the opportunity to re-evaluate whether my care actually was patient-oriented or not.

I was not able to contribute anything towards the Bhutanese nurses or nursing students. However, through working as a nurse in a foreign country, I was able to learn many things including the Bhutanese way of thinking about life-and-death and nursing, the importance of mutual support and cooperation, how the thoughtfulness and kindness of the Bhutanese is reflected in their nursing and medical care, and how slowing down would improve my patient care. It became a valuable chance to reconsider my own humanity and nursing values. Being called "kind sister (nurse)" by the nursing students and the families of the patients made me happy and it felt like my nursing had been acknowledged.

Thanks to the chief nurse and other staff members of the ward who kindly sent me off on this dispatch round, and the nursing department and the public relations officers who supported me, my month went by without any issues. I am very grateful.

Photo with JDW Hospital nurses

Period February 5 to 22, 2018

Assistant professor, Dpt. of Hematology and Oncology

Junya Kanda

Activities

①Performing hematological care in the ward and outpatient clinic and providing training and lectures to residents at JDW Hospital

②Providing training to technicians at the hematology test department of JDW Hospital

Issues noticed during the activities

Every morning at the medical ward, a team composed of three doctors, namely, an intern(1st to 2nd year of career), a medical resident(3 years of career)and a consultant(senior doctor), takes a couple of hours to go on a round of hospitalized patients. During this round, education was given to interns and residents (presentation of newly admitted patients is usually made at the morning conference). Although the contents of education and guidance vary greatly depending on the consultant, a certain educational system seemed to have been established and some physicians provided courteous instruction not only on the differential diagnosis and therapeutic strategies but also on presentation methods for interns and residents. The system according to which imaging tests such as CT and MRI and examinations that are conducted in India cannot be done without the consultant's permission seems to contribute somewhat to examination with limited resources and reduced medical costs.

Thanks to the above-mentioned educational system, residents are excellent, but it may be impossible to conduct adequate medical treatment because there are too many inpatients and outpatients.(One resident often has about 70 outpatients to take care of.) However, the residents in Bhutan must handle a wide range of diseases from cirrhosis to stroke, and also have sufficient knowledge about differential diseases. They seem to have superior skills to Japanese residents of the same generation as far as both medical care and practical procedures are concerned. Consultants who are also known as senior doctors were not only familiar with their own area of expertise but also with general internal medicine. However, because there are no hematologists, approaches to hospitalized patients with idiopathic thrombocytopenic purpura or pancytopenia were inadequate.

Multiple patients with alcohol-related diseases such as alcoholic cirrhosis, alcoholic myocardiopathy and beriberi, and patients with tuberculosis-related diseases such as tuberculous pericarditis were hospitalized in the medical ward.(The hospital has a separate tuberculosis ward.)Regarding blood disorders, three patients with idiopathic thrombocytopenic purpura, one patient with acute leukemia, one patient with suspected recurrence of acute lymphocytic leukemia, one patient with chronic myelocytic leukemia, two patients with thrombocytopenia of unknown cause, two patients with neutropenia of unknown cause and one patient with pancytopenia were hospitalized, and bone marrow aspiration was scheduled as necessary. However, there were only two bone marrow puncture kits, and the number of bone marrow examinations per day was limited. Bone marrow biopsy also included technical and equipment issues(there was only one biopsy needle set), and the threshold appeared to be very high. A patient with pancytopenia underwent bone marrow aspiration but a bone marrow smear could not be prepared due to a dry tap. Biopsy was then performed, but the in-house pathologist could not reach a diagnosis, so a hospital in India was requested to provide a second opinion. The hemogram was normal. However, since the condition of the patient deteriorated during follow-up, I re-conducted a bone marrow aspiration to prepare a bone marrow smear by spraying a very small specimen of bone marrow aspirate, and the patient was diagnosed with acute leukemia on the

Bone marrow examination

same day. As described above, diagnostic bone marrow examinations using sprayed bone marrow aspirate had not been performed before.

One of the technicians in the blood test unit who writes comments on peripheral blood smears was trained in the UK and has very in-depth knowledge of the examination of peripheral blood smears and their clinical interpretation, so he played a very important role in the education of other younger staff. However, examination of bone marrow images and flow cytometry examination seemed to be inadequate. Flow cytometry examination using peripheral blood specimens is performed when abnormal cells increase in the hemogram, but bone marrow specimens could not be prepared because there were no filters for processing of bone marrow specimens. I encountered a patient who could not be diagnosed with acute lymphocytic leukemia or acute myelogenous leukemia in the hospital since flow cytometric examination of bone marrow specimens could not be performed in patients presenting with acute leukemia and a normal hemogram and peroxidase staining could not be performed(because there was not a stable supply of the stain solution, and the examination was discontinued). For the diagnosis of hematopoietic disorder, examination of the bone marrow smear and flow cytometry examination by a technician of the hematology department are essential. If an accurate diagnosis is obtained in the hospital, it will not be necessary to send the patient to India, which will reduce the medical expenses. In addition, since JDW Hospital is the largest hospital in Bhutan, numerous patients with hematological disorders have been hospitalized and I realized that a hematologist is required.

Accomplishments and results of this dispatch

Appropriate medical care and guidance were performed for outpatients and inpatients with blood diseases. Five bone marrow examinations were conducted and also applied to make a diagnosis. Blood disease medical care was improved through resident lectures(2 lectures, namely on myelodysplastic syndrome and idiopathic thrombocytopenic purpura). During this period, since several patients with idiopathic thrombocytopenic purpura were admitted, the explanation about the eradication treatment for Helicobacter pylori(the rate of infection is higher in Bhutan than Japan), which is not included in Western guidelines, was very beneficial, allowing them to actually experience the rapid increase in platelet count in response to eradication therapy. In Bhutan, research on the efficacy of Helicobacter pylori eradication treatment can be expected in the future. Other issues in the hematology test department were also highlighted and improvements were suggested.

Meeting with the chief hematology technician

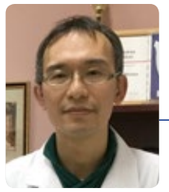
Proposals that can be made to JDW Hospital, the University of Medical Science of Bhutan and the Bhutan Ministry of Health

Bhutan seems to have a shortage of doctors and specialist physicians. I would like Bhutan to remain focused on the development of specialists in the country. It seems necessary to dispatch regular doctors to rural areas, but it is also important to make personnel changes to an extent that does not obstruct the training of specialists. Instructions by volunteer doctors through Health Volunteers Overseas may also have to be considered more actively.

Overall impression of the present medical assistance activities

As expected, the hygienic environment and infrastructure in Bhutan are still insufficient. Regarding medicine in Bhutan, while access to the most recent information from around the world is possible due to the spread of the internet, and there are many highly knowledgeable doctors, medical care is limited by a lack of doctors and testing is limited by insufficient medical equipment. As such, knowledge about the current situation was updated. However, we strongly felt that by improving the standard of doctors and test technicians, we would be able to contribute to improve the level of medical practice.

Period **February 17 to March 3, 2018**



Program-specific assistant professor, Dpt. of Hematology and Oncology

Takashi Miyoshi

Activities

①Performing hematological care in the ward and outpatient clinic and providing training and lectures to residents at JDW Hospital

②Providing training to technicians at the hematology test department of JDW Hospital

Issues noticed during the activities

①The inpatients' medical records are maintained in the hospital, but outpatients bring their own medical records themselves, and the doctors check them within a limited time and write down the estimated diagnosis and the results of examinations in the notebook. This system seems to have certain benefits(patients bring all information to any hospital), but from an epidemiologic point of view, there are various problems such as restrictions on assessment of the total number of diseases and the duration of treatment by different healthcare professionals. I felt it essential to take measures to keep records in the hospital in some way, such as copying the medical records brought by the patients.

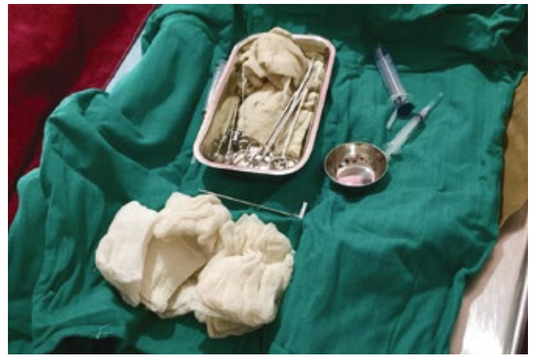
②The hospital windows were opened, and the corridors were flooded with water after cleaning. Although patients with severe neutropenia were hospitalized in private rooms, it seemed difficult to prevent infectious diseases such as Aspergillus infection that must have been carried by dust that entered through the open window.

③I found that a gauze covering the access puncture site to a central vein for dialysis had peeled off, and a Bhutanese doctor considered it a problem during the round. When he asked me whether the same thing might be observed in Japan, I replied "Occasionally" (e.g. when a patient tries to remove the tube). I felt it necessary to change the perception of that point.

④Shortage of doctors(detailed below)

Accomplishments and results of this dispatch

We continued within the framework of the three



Mark needles used for bone marrow puncture

activities that Dr. Kanda, who supervised initially, had created. The contents of the activities are as follows.

①Receiving consultations by residents(discussing the diagnosis and treatment policies)

②Discussing bone marrow examination results in the blood laboratory, and reflecting the results in the medical practice

③Giving lectures to residents

①Bone marrow examinations of patients with pancytopenia were performed before the holiday(the current King's birthday). Analyzing them by myself on the morning of the holiday showed increased blast cells and AML was detected. With smears in the foreign country that are different from those in Japan and uncertainty about which patient it was, I had planned to proceed on the day after the holiday; however, I reported it by email to Dr. Kanda only. The reply advised me to immediately inform the resident doctor of my suspicion of AML, which I did by email. The resident acted immediately, and blood transfusion, etc. were conducted in preparation for the patient's transfer to India. The patient was transferred without delay.

Two CML patients were diagnosed with the chronic phase on a myelogram and treatment began with imatinib 400 mg/day(other first-line drugs were not listed).

Patient with ITP: I informed the doctor that it is necessary to administer a large amount of IVIG for 5 days starting 7 days before the splenectomy, and to prepare PC in case the preoperative platelet count is insufficient.

Patient with severe neutropenia: The patient had received CyA during previous incidences of bone marrow failure(?). However, due to such adverse

reactions as edema, the patient discontinued the drug independently and was admitted to the hospital with a neutrophil count of below 500. Bone marrow showed marrow hypoplasia, and AA and ICUS were suspected. Taking the environment into consideration, it was considered the best to resume CyA, and I requested to persuade the patient. The trough value was 150 to 200 and a CPFX(until the neutrophil value exceeded 500)+ ST combination was administered for infection prevention.

②Particularly meaningful discussions were achieved in the following two cases.

The first case occurred on the morning of the last working day. I was asked by the resident to look at a myelogram showing pancytopenia(?)in a 7-year-old child. Looking together with the test technician in the blood laboratory, we detected numerous small objects inside the macrophages. At the instant the technician saw this, he commented "Leishmania!" This relatively common infection in Bhutan is called "leishmaniasis" and is caused by an insect. It was documented that it is transmitted through small flies(sandflies)and is treated with a drug called "miltefosine."

The other case occurred the day after the holiday when the technician showed me a peripheral blood smear of a baby(approximately 19-day old)in the NICU with suspected ALL. The staining was poor, but the core of some slightly large lymphocytes seemed delicate and nucleoli were noted as suspected. When arriving the NICU to report this, Dr. Nishizawa happened to be there and I was able to discuss it with him. As a result, it was revealed that the baby had been intubated in the NICU and was receiving treatment for an infection. The perinatal platelet count was 166,000, decreased to 35,000 and then normalized at 196,000. Afterwards, it decreased again and the recent count was 11,000. Concluding that this was test result fluctuation as part of an infection, and not leukemia, we decided to wait for the results of the peripheral blood FCM submitted to the blood laboratory of JDW Hospital. The following day, I was able to discuss it with the FCM technician and Dr. Tashi from the pathology department. Due to the lymphocyte grouping of approximately 10% comprising mainly of T-cells(approximately 90%), and that the occurrence of CD45 had not decreased, everyone agreed that the T-cell group was normal and that infection treatment would continue while closely following the peripheral blood smear.

③Blood disease treatment was improved through a resident lecture(1 lecture on multiple myeloma).

Lecture for residents

Proposals that can be made to JDW Hospital, the University of Medical Science of Bhutan and the Bhutan Ministry of Health

Bhutan seems to generally have a shortage of doctors and specialist physicians. I think that it is necessary to establish a mechanism whereby doctors who have learned expertise in other countries return or want to return to Bhutan to work in their home country.

At the same time, I felt the necessity for healthcare professionals other than doctors to take charge of work within their own fields of expertise.

① At the outpatient unit, many patients visited the hospital every day. In the Department of Medicine, one resident examined more than 50 outpatients while checking the patients' medical records that they brought with them. Despite the chaotic state whereby the next patient entered the examination room without permission even during the examination of another patient, the resident finished the physical examination, made a presumptive diagnosis, and ordered the targeted examinations. A few such excellent doctors take turns consulting many outpatients. I think that administrative staff should at least be responsible for management of the ID and the name the outpatients using a PC. In addition, if a system can be introduced whereby administrative staff can ask patients about their symptoms and diseases, classify them to some extent before the medical consultation, and tell the doctor, it can be expected to decrease the burden on the doctors and protect patient safety.

② While I stayed in Bhutan, there were only three physicians at the Department of Medicine in JDW Hospital due to traveling abroad and sick leave. It seemed that the residents studied by themselves and provided medical care according to the diagnostic policy. It seems necessary to establish a system of consultation with specialist doctors, including overseas doctors. In particular, it seems that discussions using Skype and e-mail exchanges are becoming increasingly important, as previously mentioned.

Overall impression of the present medical assistance activities

From pouring water on the floors during the day and cleaning it with mops, to using dirty vinyl bags to cover one's shoes when entering the NICU, awareness of the hygienic environment and infrastructural maintenance were insufficient.

Appropriate usable drugs also seemed to be very limited. Treatments for multiple myeloma were limited to melpharan, thalidomide, steroids, and drugs that had been used a decade or two ago.

On the other hand, the presentation ability of residents during rounds and the discussion and diagnosing skills of staff doctors are very high. The test technician, who analyzes microscopic tests, is diligently reading the WHO Book, and the attitude of a group of highly skilled individuals exerting themselves despite the poor infrastructure is astounding. I felt that improving the level of other professionals can contribute to improving the level of medical practice as well.

I would like to talk about what influenced me personally during this voyage.

When I was observing outpatient examinations, a young man visited with the complaint of tremors of his fingers. A resident doctor checked for focal symptoms, listened to the patient's heart and said "the pitch of the second heart sound…"(the rest was inaudible), suspected pulmonary hypertension, and put in an order for an ECG. At the time, I was completely unaware but, a neurologic symptom of hypercarbia(in severe cases, CO_2 narcosis can induce coma)was tremors. While I do not know the result, I take off my hat to the attitude to deduce that much within minutes and strive towards a diagnosis using limited resources.

While I imagine that the Bhutan assignment for doctors who barely speak English was their first, my stay was one of receiving help from the medical student Ishibashi who accompanied me all the way on the voyage. I am deeply grateful toward all the staff at JDW Hospital who, despite my inept English, persevered and accompanied me in our communications in writing. I would also like to express my sincere thanks to Professor Takaori, the outpatient department director Kondo, the ward manager Hishizawa, and the doctors and nurses in the ward for granting me this opportunity.

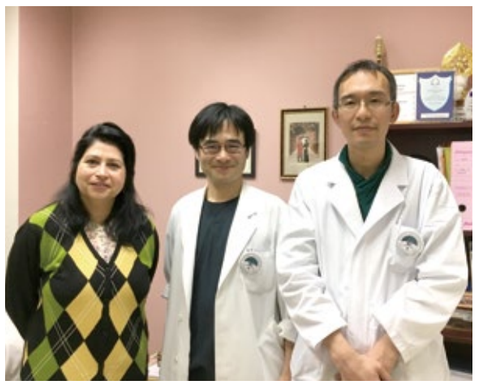


Photo with the blood bank supervisor, Dr. Mahrukh Getshen

Photo with the local staff in the medical ward

Period **February 5 to March 3, 2018**

Nurse,
Nursing Department

Yurie Omae

Activities

I worked for 1 month in the kangaroo mother care unit (hereinafter, KMC unit) in the Neonatal Ward of JDW Hospital.

Although everything was completely unfamiliar at the beginning of the dispatch, I accompanied the nurses on their daily routines to grasp the flow of a day in the unit.

The KMC unit was very interesting and something of which I had no experience in Japan. In this unit, 24-hour constant KMC is possible. Parents who hesitate to perform KMC are actively encouraged to do so by the doctors and nurses. There is also frequent guidance on KMC by the chief nurse.

While the KMC unit is located across the hallway in the same ward as the Phototherapy unit, most nurses are stationed in the Phototherapy unit with a high patient turnover, leaving one nurse to care for seven to nine patients in the KMC unit. However, as the previous team has reported, patients are basically taken care of by their family. The same is also true for babies; since the parents are essentially constantly with their babies to care of them, it felt that the duties could be performed even if there would be just one nurse.

I was also able to experience blood sampling from babies almost every day, which is something very unusual in Japan. The nurses were saying, "There are too few doctors, so the nurses have to do everything," but I thought their assessment skills that do not only rely on the monitor, as well as their technical skills are high.

Concerning involvement in the ward, I prepared English translations of methods for latch-on breastfeeding and methods for simultaneous breastfeeding of twins. Parents learned about breastfeeding and milking assistance very quickly and the assistance of staff was not needed, even with preterm babies. As for breastfeeding guidance, there was only a pre-childbirth parents' class showing a video and one to two post-childbirth guidance sessions. I was surprised by the high skills of the parents who learned just with that; however, because of this, I often witnessed breastfeeding and milking assistance methods that were ineffective, and parents sometimes asked me for assistance. Moreover, while there is a page in the maternal handbook introducing breastfeeding methods, I felt that parents did not have many opportunities to see it since it was kept with the patient's medical record. Therefore, for future guidance, I prepared something parents can keep with them and something with pictures that can be easily understood.

Issues noticed during the activities

There were posters in the ward to promote 5S activities, provide hand hygiene enlightenment, and to show how to wash one's hands. Also, when seeing the chief nurse instructed the patient's family on how to disinfect their hands and fingers, I realized that the activities our predecessors had carried out were taking root. Some staff does not practice the concept of hygiene, even if they know about it, and it seems that it will take some time to change the behavior of all staff members.

Assistants clean the floor and other staff members work to prepare their working environment every morning. However, I often found that only those areas that can be seen by the staff are properly cleaned, while personnel and patients' family members throw garbage on the floor and dust accumulated on the blood sampling cart. I felt it necessary for staff members and patients' family members to raise their awareness of keeping the environment clean.

It is also important to maintain the environment and items that can disinfect the goods necessary for breastfeeding and teach the correct method and knowledge in the future. Staff and patients' family members seemed to understand that disinfection is important to babies, but the environment and knowledge including finances were not adequate.

Accomplishments and results of this dispatch

I engaged in the work constantly thinking of what I can contribute during the 1-month period. I started with learning about the current status of medicine and nursing in Bhutan as well as childcare there. As a result, with many holidays and only a short working period, I did not think that I could contribute anything in terms of assistance. However, it was all a very valuable experience for me personally.

As I mentioned previously, the family takes care of the patient's every need 24 hours a day. Moreover, they would also cradle other crying babies, assist with examinations, and interpret between the parents who do not speak English and me who cannot speak Dzongkha. The sight of them naturally and spontaneously helping each other was wonderful and heartwarming. I was able to experience the thoughts and culture of the Bhutanese people, something that you cannot do in Japan.

The attitude of the staff towards childcare guidance was to observe as far as possible. Even when necessary, they provided guidance via a hands-off approach. The stance of realizing the parents' potential and not instructing more than necessary provided me with a good opportunity to review my own way of nursing with a hands-on approach, with which I could feel a sense of accomplishment of having performed care.

When performing breastfeeding or milking assistance, seeing the parents earnestly listening and striving to implement what I had taught them despite my poor English made me happy and gave me confidence. I also experienced blood sampling from babies, which you cannot really experience in Japan, and I feel that my skills have also improved.

Through this dispatch, I was able to discover new personal challenges.

Proposals that can be made to JDW Hospital, the University of Medical Science of Bhutan and the Bhutan Ministry of Health

It would be good if their awareness is enhanced and disinfectant can be available so that items required for breastfeeding can be disinfected properly.

Overall impression of the present medical assistance activities

I always hoped to be a part of this endeavor. My wish came true and I was granted the opportunity to participate in the dispatch.

Before the dispatch, I was partly worried and anxious about language and working and living abroad for a month, and partly excited for the valuable experience of being able to experience non-Japanese medicine and nursing. However, I will never forget the thrilling sensation I felt when I arrived in Bhutan.

I was in a loop of constant nervousness as a result of working in an unfamiliar environment, but the local staff would talk to me in kind voices and allowed me to work while feeling at ease. Being able to work for the first time at a specialized place called the KMC unit allowed me to not only experience medicine but also Bhutan childcare. Childcare involving direct physical contact makes both the child and the parents feel at ease, and they probably do not feel the insecurity of mother-child separation we experience in Japan. When I return home, I would like to introduce the warm nursing of Bhutan to Japan and integrate it as far as possible.

During our dispatch, there were many holidays such as the New Year and the King's Birthday, giving us an excellent chance to get to know the Bhutanese culture. I cannot forget the lovely faces of the children greeting us in the city. The experience of working and living for 1 month in Bhutan where I visited for the first time, has become a priceless asset to me.

Lastly, to all those who politely listened and tried to understand my poor English, including the hospital staff, the families of the patients, and the local people, I would like to say thank you.

I would also like to offer my deepest gratitude to those concerned at Kyoto University, JDW Hospital, and University of Medical Sciences of Bhutan for granting me this valuable opportunity, and also to the hospital where I am currently assigned, Ayabe City Hospital, for kindly sending me off despite their busy working schedule.

Photo with local patients

Period October 7 to 18, 2017
March 18 to 25, 2018

Associate professor, Dpt. of Obstetrics and Gynecology

Tsukasa Baba

Period March 18 to 25, 2018

Chief physician, Obstetrics and Gynecology, Mitsubishi Kyoto Hospital

Masumi Sunada

Issues noticed during the activities

All patients who need specialized gynecologic care in Bhutan have been centralized at JDW Hospital. There are over 4,300 deliveries per year at JDW Hospital, whereas the number of major gynecologic operations reaches 400 cases per year, indicating that clinical practice is excessively focused on perinatal care.

Team 8 visited mainly for inspections, and we were impressed with the passionate education whereby six senior doctors and four trainees took turns to hold theme-specific presentations every morning from Monday through Saturday(twice and four times, respectively), and at the time of the director's ward round on Tuesday, a bed-side oral examination on one patient of interest per week was held for more than 1 hour with trainee doctors, interns and medical students. On the other hand, most of the education was devoted to perinatal and preventive medicine. The director is familiar with perinatal guidelines and key texts and always conducts tough oral tests based on encyclopedic knowledge in daily practice, so I found that all doctors including senior physicians focused on perinatal care while they were concerned about gynecologic tumors and surgery. Since there are more obese people in Bhutan than in Japan, it is difficult to ensure the visual field with laparotomy surgery. Although many of the local doctors recognize the necessity of laparoscopic surgery and 185 laparoscopic operations per year are conducted, mainly for oviduct ligation as a method of sterilization surgery, oviductal pregnancy surgery and ovarian benign tumor surgery, they cannot expand application of the procedure due to a lack of experience. Systematic surgical education has not been provided in the field of gynecology where empirical rules have been emphasized. A request for gynecological surgery education including laparoscopy procedures was received from the trainee doctors.

After Team 8 returned, Team 9 was dispatched to provide guidance on laparoscopic surgery mainly for trainee doctors, and the primary objective was to introduce, especially, laparoscopic simple total hysterectomy, which is not conducted in Bhutan. Since the actual working period was as short as 5 days, I created the educational materials in advance in Japan, and scheduled the lectures and training exercises on laparoscopic surgery after the morning conferences and the main consultation hours, as far as possible, after consultation with the local doctors.

Since I had an opportunity to help with a laparotomy procedure in the morning on Day 2, I participated in the surgery with the purpose of getting to know the actual condition of the operating room. First, the concept on hygiene in the surgical field was different from Japan. No uniform standard has been established among the staff members regarding securing of clean areas and handling of clean items. Therefore, I felt uneasy about whether hygiene was ensured in the operating room. I found a relatively large number of wound infections associated with cesarean sections at the time of the ward rounds, which might have been due partly to poor hygienic control of the surgical field. Staff education on hygiene management is obviously necessary, but the expanded application of laparoscopic surgery may also contribute to a reduction in the number of wound infections after surgery.

In the afternoon on Day 2, six gynecologists completed training for laparoscopic surgery using a training box. Training is very important to introduce laparoscopic surgery and shorten the learning curve. I heard from the staff that the hospital has no equipment for practice, and suture training is done only when it is actually needed, but they probably have some opportunities. Using training equipment brought from Japan, I explained and demonstrated needle holding and ligature assuming actual intracorporeal suturing. Participants actively practiced and soon understood the basics of suturing procedures. It was a great harvest for me to see that all the participants enthusiastically worked during training and sometimes pointed out certain points to be improved to each other. I strongly emphasized that it is most important to continue practicing, as accurate suturing during actual surgery is more difficult than during practice. Whether training can be continued depends on their motivation.

I joined three laparoscopic surgical procedures on Day 3. The first patient underwent the first ever laparoscopic simple total hysterectomy conducted at JDW Hospital, and the second and third patients underwent laparoscopic ovarian operations (oophorocystectomy and adnexectomy). We prioritized safely completing the surgery with surgical instruments that are available in the hospital and brought a minimum of necessary equipment that are not available in Bhutan, from Japan. Especially, the first patient was obese, weighing more than 90 kg, and the surgeons struggled with the unfamiliar instruments, so we completed the operation with few explanations. There were many unexpected problems in the situation where we did not have enough equipment for all three patients. However, we could share various countermeasures with the local staff including improvement strategies. There were some inadequacies; they did not fully understand the basic surgical position, the placement and preparation of equipment, and how to use the equipment. However, if the team members in the operating room obtained a deeper understanding of laparoscopic surgery and shared more knowledge, then it can be expected that they will improve. A local doctor initially conducted the operation on the third patient, but due to the risk of damage to other organs associated with unusual

Laparoscopic surgery

Lecture

port placement and unfamiliar surgical procedures, I also took a turn and performed surgery. In order for them to actually learn the procedures, they need our ongoing support for a while.

Since there was no surgery scheduled on Day 4, I gave a lecture on laparoscopic surgery as a review of the surgery performed the previous day. I gave a lecture on oophorocystectomy at the morning conference, and a lecture with a video focusing on simple total hysterectomy at the afternoon conference. A doctor working for JDW Hospital stated that the technique used for simple hysterectomy operation they had learned during laparoscopic surgery training in India was simpler than the one we taught. Although it is easy to introduce the technique used in India, I explained the procedures so that they can select either of the procedures considering the future development of malignant tumor surgery and avoiding the risk of damaging other organs in atypical cases.

I conducted laparoscopic simple total hysterectomy again in the morning on Day 5. As with surgery on Day 3, I was impressed with the local doctor's technique of cleanly inserting the first trocar. This seems to be a technique that was developed to handle the lack of equipment and the many cases of extreme obesity. I demonstrated surgery while explaining the key points one by one based on the lecture of the previous day. The patient who underwent surgery was obese and had severe adhesions. The local staff understood how our technique contributes to securing vision and avoiding ureteral injury. Since the local staff could not afford to conduct surgery this time, I would like to support them in completing surgery if there would be another opportunity. In the afternoon on Day 5, Dr. Baba demonstrated surgery for the treatment of the

vulva cancer at the request of the local doctors, and Dr. Sunada provided guidance using a training box again. Since two trainee doctors participated from the beginning, we could give intensive guidance to them. Their forceps technique obviously improved compared with that observed during training on Day 2. It was impressive that the trainee doctors who participated remained focused on the exercise.


Surgery with local doctors


Box training: last day

Proposals that can be made to JDW Hospital, the University of Medical Science of Bhutan and the Bhutan Ministry of Health

The primary purpose of this activity was demonstration of and guidance on laparoscopic surgery to trainee doctors, focusing on educating them. However, since they will work at hospitals in rural areas for a while after leaving JDW Hospital, they will have few opportunities to perform laparoscopic surgery. In order for them to continuously perform laparoscopic surgery at JDW Hospital, a full-time doctor of obstetrics and gynecology should acquire proficiency in laparoscopic surgery and instruct the younger physicians on the surgical technique. I felt it necessary to continue training at the central hospital for a while so that the trainee doctors can become more familiar with laparoscopic surgery.

Team medical care is particularly important for laparoscopic surgery. Not only the skill of the surgeon, but also the cooperation of the assistants, nurses, and clinical engineering technicians are all making it possible to provide high quality medical care. Although it is a fact that technical guidance to doctors is required, giving technical instruction and hygiene management guidance to surgical nurses and clinical engineering technicians will lead to improvement of the surgical environment and the overall medical care.

It will be helpful to provide off-site programs such as periodic web conferences as well as on-site training such as practical training and surgical instruction as one way of training doctors. Since there are no obstetrics and gynecology societies in Bhutan, establishing an academic society and becoming a member of the Asian Oceania Obstetrics and Gynecology Association will open a way of receiving global support.

Period November 25 to December 15, 2018

Clinical fellow,
Dpt. of Pediatrics

Hirofumi Shibata

Activities

- Supervision of the pediatrician program
- On-site medical care and participation in rounds in the Pediatric Ward and PICU of JDW Hospital
- Guidance, advice, and lectures to local doctors and residents

Issues noticed during the activities

I was dispatched to JDW Hospital for 3 weeks from the end of November 2018. The theme of the present dispatch was “supervision of the pediatrician program,” and I informed my local counterpart, Dr. Mimi Lhamu Mynak, of our intention by email before leaving Japan. After arriving there, I cooperated with their medical services, while inspecting the entire pediatric department, in consultation with Dr. H. P. Chhetri, who mainly supervises the pediatric inpatients ward and PICU. More specifically, I joined the daily round for all patients in the Pediatric Intensive Care Unit(PICU) and pediatric inpatients ward with residents to inspect the current situation of pediatric care and resident training in Bhutan through bed-side medical care and discussions. During the rounds, I asked about the treatment strategy for each patient in Bhutan and then explained the strategy in Japan, proposed tests that should be added, and provided guidance. After the end of a round, I assessed newly hospitalized patients with the residents and visited related departments to understand the actual situation.


Photo with Chief nurse of Department of Pediatrics


PICU round

In addition to the rounds in the pediatric department, I also joined a round in the surgical department once. I was impressed with the way the local physicians confirmed the understanding of the residents and interns, not only by discussing a patient’s disease and current problems in the presence of the actual patient, but also by repeatedly asking diagnostic criteria, treatment strategy, patient management, etc. in detail and teaching points to note on the spot to them in a thoughtful manner. I felt that this bed-side training is implemented thoroughly because the residents and interns will have to see various patients by themselves after they are transferred to a local hospital/clinic in the future.

I think that the pediatrician development program allows the residents to have very meaningful experiences as a general pediatrician with a variety of patients in terms of bed-side training. However, in the discussions with the local supervisory doctors, the following points were raised as issues: Systemic training in each specialized field is insufficient because there are only general pediatricians, and residents cannot experience the entire process of diagnosis and treatment for patients with intractable conditions, who are transferred to India.

I was also consulted about the management of atopic dermatitis and the response to food allergies in outpatients, and then explained and provided guidance on responses that can even be taken in Bhutan. Since the residents and interns were not positive towards performing ultrasonographic examination themselves, I provided guidance on general screening tests by ultrasonography and explained the importance of seeing things themselves.

Most of the patients in the pediatric ward and PICU

were suspected to have infections, and patients in various conditions (e.g., cardiac disease, renal disease, nutritional and metabolic disease, neurological disease) were referred to JDW Hospital. On the other hand, the blood test parameters that can be measured in the hospital are limited, and measurement of other test parameters has to be entrusted to a testing company. Therefore, I often had difficulty assessing the clinical condition of patients soon after hospital admission. During this dispatch period, the MRI system, the only unit available in Bhutan, was out of order and fixing it would take about 1 month; it was also difficult to examine patients with suspected neurological disease.

Medical care-related issues and problems I particularly noticed are listed below.

①Development of doctors with sub-specialties

Since there were no pediatricians with sub-specialties, except for the NICU, a system was adopted whereby the partner hospital in India is consulted about children with intractable or complicate conditions, and such patients are transferred to that hospital as necessary. During the dispatch period, I occasionally saw cases whose results of cardiac ultrasonography were inaccurate, who were transferred for a renal biopsy although the symptoms were mild, or whose condition worsened while debating whether to have a consultation or not, and I felt that improving the consultation system and developing doctors with sub-specialties are future issues. Some of the residents in the pediatric department were interested in renal diseases or NICU, and it seemed that the need for sub-specialization is recognized there. Considering the rate of transfer to India or Thailand, I think that it is an urgent task to develop pediatric cardiologists who can make accurate decisions based on ultrasonography and the indications for surgery.

② Importance of nutritional guidance on a country-wide level

According to the website of the Tourism Council of Bhutan, it is reported that 31% of the population in Bhutan are poor in terms of income. It seems that the people are living without worrying much about clothing, food, and housing, thanks to the government measures. Since I had such an impression, I was surprised that many children were admitted in the PICU or pediatric ward with beriberi heart disease caused by vitamin B1 deficiency or Wernicke's encephalopathy-like symptoms during the dispatch period. There were also quite a number of school-aged children who were found to have poor weight gain possibly due to malnutrition (without any apparent endocrine abnormalities).

Based on an interview at the nutritional department, meals consist mainly of polished rice with a high carbohydrate energy ratio of 70% and a protein energy ratio of approximately 10%, which is unbalanced, and there are many beriberi patients, even in the capital city Timphu. Since the situation of vitamin B1 deficiency in infants is serious, awareness-raising activities, especially among pregnant women and lactating mothers are considered essential. According to their explanation, the nutritional department provides nutritional guidance via workshops, but it has only a temporary effect, and their efforts are not sufficient in rural areas, where foodstuff is limited compared with urban areas where plenty of foodstuff and supplements are available. I think that awareness-raising activities and efforts at a country-wide level are necessary to improve the situation.

Inpatient children not only received vitamin B1 supplementation, but also underwent daily assessment of body weight gain, and dietary supplements such as F100 were supplied as necessary, and the doctors spent a considerable amount of time to provide nutritional guidance to the parents and other family members. It seemed that the doctors do not collaborate with the nutritional department. I felt that by establishing a collaborative relationship with the nutritional department, so that nutritional assessment is possible even during hospitalization, it would be possible to provide medical care more efficiently.

③ Prevention of infection and response to nosocomial infection

The previous report has stated that highly resistant strains of Escherichia coli, Pseudomonas aeruginosa, etc. are prevalent in Bhutan; the situation is also true in the pediatric and neonatal fields. I was surprised that gentamicin and ciprofloxacin, which are not commonly used for children in Japan, were frequently used there. The doctors always took care to disinfect their hands before a medical consultation, but gloves were used only when nurses performed certain procedures.

When a child with chickenpox (routine vaccinations are not available in Bhutan) was admitted to the hospital during the dispatch period, there was no available room for immediate quarantine, and we had no choice but to isolate the child in a large general ward room after transferring the other patients in the room. However, since large ward rooms do not have doors that can be closed, there was concern about airborne transmission to patients and their families sharing the passage ways and bathroom.

I saw patients' families cooperating with each other to take care of the patients, which was a heartwarming scene. However, there were no curtains or partitions between the beds, and I occasionally saw such incidences as a child with severe heart disease lying across from a child with cough due to infection developed upper respiratory tract symptoms several days later and the child's condition worsened. I had the impression that the situation is not sufficient in terms of the prevention of infection.

④Improvement of the medical chart system and the need for statistics

Residents of the pediatric department were given various research themes and collected data to write theses on renal disease, vitamin B1 deficiency, etc. However, when I asked them about the statistics of these diseases, they only answered "mainly infections," which implies that annual statistics are not taken in the pediatric department.

Medical care was mainly recorded on paper medical charts, except for some hematology/imaging data. For outpatients, since the information is written in a notebook that is kept by the patient, who takes it home, the outpatient unit for pediatric chronic diseases had a dedicated ledger-type notebook to ensure that information is recorded both in the notebooks of the patient as well as the outpatient unit ledger.

As for medical charts for inpatients, information was written on standardized hospital forms that were bound in a ring file, which was retained in the medical chart archive after the patient was discharged. In the medial chart archive, data were processed so that simple statistics based on the International Statistical Classification of Diseases and Related Health Problems (ICD) could be taken using Microsoft Access, but the amount of medical charts exceeded the capacity of the archive and the charts were piled in high stacks by month of hospital admission on the floor of the archive.

To efficiently perform statistical processing for thesis preparation and epidemiological research, it is considered necessary to improve this system.

Accomplishments and results of this dispatch

Despite the short period of time, I could grasp the actual situation of the pediatric care and resident training at JDW Hospital by inspecting various departments. I was given the opportunity to give three lectures, in which I could learn about problems they frequently encounter in daily medical practice and situations on which they need advice through discussions.

Lecture for local doctors

Since the period of the present dispatch was as short as 3 weeks, I emphasized the importance of keeping in touch. I exchanged email addresses with the local doctors and residents, and asked them to email me if they have any problems. I would like to maintain this communication system.

Proposals that can be made to JDW Hospital, the University of Medical Science of Bhutan and the Bhutan Ministry of Health

- There is an absolute shortage not only of doctors but also nurses and allied healthcare professionals, which creates harsh working conditions. This system, which heavily depends on individuals' efforts, may collapse at some stage, and I therefore think that further recruitment of personnel, improvement of their treatment, as well as improvement of the work environment should be considered to ensure continuous and stable provision of medical care.
- A number of infants and young children suspected to have serious vitamin B1 deficiency were transferred to JDW Hospital, and I had the impression that

they accounted for about half of those admitted to the PICU. The eating habits based on imbalanced carbohydrate-heavy meals consisting mainly of polished white rice, use of thiaminase-containing flavorings such as Doma, and alcohol intake by pregnant women and lactating mothers are considered to contribute to the situation, and I therefore think it is necessary to raise the awareness of the entire country concerning their nutritional intake.

● Epidemiological data are important for the country of Bhutan to grasp and consider improving the medical circumstances and to reinforce the primary prevention of diseases. I felt that improvement of the medical chart system (including computerization, etc.) is an important issue concerning the training and development of highly specialized residents in the future.

● I also felt it necessary to further improve both the test parameters and facilities (hematology and imaging) in response to the on-site needs as a base hospital of the country.


Pediatric playground

Overall impression of the present medical assistance activities

Bhutanese people both in and outside the hospital were all friendly and kind. Bhutanese children, as I saw them in the city, seemed more active than Japanese children of the same age and I was impressed by the fact that they were running around with twinkling eyes and loud voices.

The doctors at JDW Hospital were generally very education-minded, curious, gentle, and friendly, and I therefore had no particular problems communicating with them, which I had worried about. As for medical practice, in which volunteer doctors from all over the world including the US and France were also actively involved, I felt that the level of medical care is not very different from that in Japan. On the other hand, the situation of limited tests for difficult-to-diagnose cases, etc. and the absence of specialists to consult with was more frustrating than I had expected, which reminded me of how very comfortable the Japanese medical environment is.

Period November 25 to December 15, 2018

Chief nurse (Surgery), Nursing Department

Shoko Matsuyama

Activities

We performed medical exchange activities in the operating rooms and ICU of JDW Hospital. Two dispatched nurses paired up with each other and practiced nursing management and care with the local nurses. JDW Hospital has eight operating rooms, about 30 nurses, and 15 nurse anesthetists. Four to six operations are performed in one operating room per day. The staff work on a three-shift system consisting of 8:00 to 14:00, 14:00 to 20:00, and 20:00 to 8:00, and many emergency operations are carried out, even at night. We discussed what we could do based on what we had noticed after arriving there, and addressed the issues using the PDCA cycle. We also made recommendations about what we can do to improve works needed at the clinical site with the local nurses using the PDCA cycle. In the operating rooms, we observed the general situation in terms of infection control as I was asked by the chief surgical nurse of JDW Hospital to give a lecture on that in the operating rooms. Doctors and nurses working in the operating rooms are all kind and friendly. We worked together taking into account the importance of building up a good relationship with the local staff. Regarding perioperative assistance, we worked with the local nurses during three surgical operations as scrub and circulating nurses. As doctors, technicians, and nurses have a break together and we could have a good time of conversation with them to get to know them, I focused on collecting information by asking them questions during the break time. Although material resources are limited, including protective gear, it seemed that there were many things that we could work on. I gave a lecture on infection control in the operating room and talked about in-hospital infection control for patients and health management of healthcare professionals working in the operation rooms, where they are frequently exposed to body fluids, according to our manual on the prevention of infections. After I gave the lecture until the end of the dispatch period, we took the approach of using the PDCA cycle to disseminate information on hand hygiene, recommend the introduction of a one-footwear system, and recommend the assignment of a leading nurse who manages daily surgical operations and education to develop leaders.


Lecture on infection control

In the ICU, there are 8 beds and 26 nurses, one nurse for each patient. The chief nurse has worked at the ICU for 10 years and has recorded the history and detailed statistics of the ICU from the beginning over the years. She showed me the record and I found it to be a great record. Nurses to be assigned to the ICU are subjected to 6-month training in the specialized course after receiving the nurse license. Although such nurses traditionally received training in a neighboring country, the specialized course in Bhutan started this year and produced six graduates. It seemed that the nurses worked confidently with their acquired expertise and skills. Hand hygiene was properly maintained. They actively exchange their opinions on treatment and nursing care at joint conferences for doctors and nurses that start at 10 am every day. Regarding the weekly schedule, they provide guidance to patients' family members every Monday and cooperate with the family in caring for the patients. A physical therapist visits the ICU every day, but nurses do not participate in the rehabilitation. We also reviewed things that can be introduced during nursing care in the ICU, which are actually implemented in our hospital, by practicing daily tasks including preparation of the work environment and nursing care as well as shadowing. Since a nurse had been dispatched by JICA and had worked in the ICU for two years, Japanese nursing care has already been introduced and put into practice. It seemed that local nurses were eager to improve their nursing care. There are three designated hospitals in Bhutan. JDW Hospital is located in the capital city and plays a central role in

medical care. However, since it seemed to be necessary for them to shorten the length of stay in beds in the ICU, which has only eight beds, we demonstrated our efforts in rehabilitation. Local nurses including the chief nurse of the ICU became interested and agreed with the principle of early ambulation based on rehabilitation starting on the bed, to shorten the period of use of the bed. More preparation and time may be needed to decide on how we can achieve these objectives.

Issues noticed during the activities

They had disinfectant for hand hygiene but seemed not to use it as one of the measures for infection control in the operating rooms. It may be necessary to improve the staff members' awareness, devise the location of the disinfectant, and accumulate and share historical data. In addition, patients walked barefoot in the operating rooms while healthcare professionals changed their footwear because a one-footwear system was not implemented yet. The operating rooms were cleaned, but some sharp instruments that had been dropped and residual body fluid were found on the floor. We suggested to add an instruction to patients to bring their own footwear because it would be practically difficult for the hospital to provide shoes or slippers for all. It appeared to be necessary for the hospital as a whole to introduce a one-footwear system based on the evidence data. There may be difficulties to procure material resources, but some challenges were found with the washing and sterilization of surgical instruments. Small steel instruments sterilized by autoclave were wrapped in cloth when sterilized but moisture sometimes remained on them. Endoscopic instruments and energy devices were disinfected with chemicals or formalin after they were washed in water, and then placed in the operating rooms. It appeared to be necessary to improve the washing and sterilization of the instruments, since there were concerns about sterilization assurance that may affect the human body.

Accomplishments and results of this dispatch

It is essential to provide a safe operation environment for patients and to manage the staff members' health for proper surgical operations. On December 1, I gave a one-hour lecture on in-hospital infection control in the operating rooms based on the measures that our hospital has taken, and it was attended by surgical nurses, nurse anesthetists, and anesthesiologists. I explained the importance of standard precautions because all patients do not undergo preoperative tests. I also explained some points to note in the operating room concerning infection control in case of patients with suspected acquired immunodeficiency syndrome, tuberculosis, or Creutzfeldt-Jakob disease. After the lecture, I could exchange opinions with local nurses who took an interest and shared knowledge that can be readily incorporated in their practice. Our activities during the dispatch period produced some achievements, such as: nurses implemented hand hygiene based on awareness of its importance; they newly realized the importance of protectors and started to wear them; they also started to take actions concerning patients' footwear, as there is no solution only by arguing about it. The director of the Anesthesiology Department asked me a question during the lecture. According to the director, on the day of an operation, many nurses move back and forth between adjacent operating rooms because there had not been a person who is responsible for the overall schedule of the day to take a lead role depending on the progress of the operations. One or two surgeons work on each operation, and they sometimes should perform several patients' operations at the same time. Therefore, some operations started after a waiting time, and other operations took much longer than the scheduled time. Based on this situation at JDW Hospital, the director wanted to know how our hospital manages operations. JDW Hospital has eight operating rooms but only one room is available after 14:00. I recommended that they appoint a day leader among the surgical nurses to coordinate the progress of the daily operations. I also made recommendations to the chief surgical nurse and the deputy chief nurse concerning the workflow of three measures using the PDCA cycle after the session, because I could not print out the material at the site.

I also had an opportunity to give a lecture on care for serious patients as I considered it necessary to let them know about the importance of rehabilitation with nurses' involvement. Nurses including the chief nurse and the deputy chief nurse of the ICU listened attentively to my lecture and agreed to further discuss these matters.

Proposals that can be made to JDW Hospital, the University of Medical Science of Bhutan and the Bhutan Ministry of Health

I thought it would be necessary to improve the handling of surgical drapes in the management of the operations. The Kingdom of Bhutan, located in the Himalayan range, has very beautiful nature consisting of the sky, mountains, woods and forest, rivers, and lakes. However, infrastructure facilities have not been installed, and drained water and scattered garbage are seen all over the town. Environmental preservation helps to protect the people's health and preserve the beautiful nature. Surgical drapes are always stained with blood or other bodily fluids. Used drapes are collected into collection box, washed and sun-dried in the hospital and sterilized by autoclave. Surgical fabric gowns supplied to the operating rooms often become wet. More than ten surgical drapes are needed for each operation. There are concerns about the amount of water that is required for washing and the water to be discharged, and the securing of human resources because about 40 operations are performed on one day. An incineration facility should be built when disposable products are used. It shall be necessary to discuss this based on the estimation of the cost.

Overall impression of the present medical assistance activities

We left Japan and arrived in the Kingdom of Bhutan located in the Himalayan range on November 25. I am deeply grateful to the staff members of the Nursing Department and Operation Department who supported the dispatch, and Dr. Okajima, a team leader of the dispatch taught us how to coordinate the operations and how to live on-site, which supported our activities. I greatly benefitted by hearing the reports of Team 10 members about the important matters concerning each field of expertise. I think it is important to respect other cultures and customs during international exchanges. We could have interactions with local staff members by observing how they provided nursing care, working with them, and having discussions to exchange opinions. During the 3-week dispatch period, the local nurses listened attentively to what we two nurses mentioned in the operating rooms and ICU. We could only recommend items to be improved and could not evaluate their commitment. However, we would like to keep in touch with them via email.

One thing that I found is the good relationship among the different healthcare professionals. I found they had a friendly relationship regardless of age or experience in the operating room and ICU. Teamwork is important in medical care, and communication is essential for teamwork to work effectively. Daily smooth communication among the healthcare professionals seemed to work effectively in the clinical practice. For example, safety should be confirmed based on the safety checklist in the operating room, and the number of surgical instruments should be counted at the end of an operation, to prevent foreign materials from remaining inside a patient's body. When doing this, all medical staff members in the room talked to one another to ensure that such incidents were prevented. In our operating rooms, usually a scrub nurse and a circulating nurse are allocated in each room. All staff members count the instruments in their allocated areas, isolating the members in their roles. The communication style used in daily life and English as one of their official languages may help to facilitate communication because the grammar has subjective, objective, explanatory, and passive expressions, so it is easier to clearly say what has to be communicated in clinical practice. I really want to acquire communication skills derived from usual conversation and use those skills in my nursing care, administrative tasks, education, and training.

Healthcare professionals working at JDW Hospital, the families tending to the patients, and the people I encountered in the town were all kind and gentle. Family bonds are very strong, and family members also engage in the patients' care. I wish that more appropriate medical treatment and nursing care will continue to reach patients with medical needs in the Kingdom of Bhutan through these medical exchange activities.

Period November 25 to December 15, 2018

Deputy chief nurse (CCU), Nursing Department

Hisako Harada

Activities

I worked with chief nurse Matsuyama for about 3 weeks in the operating rooms and ICU of JDW Hospital, following the advice of Dr. Okajima.

In the first week, I worked in the operating rooms. The 5S activities, which had previously been initiated, were steadily implemented in the operating rooms and ICU, and things were neat and organized, showing clear management. There were eight operating rooms in total, and an average of four to five operations were performed every day in each room. There are a few anesthetists, and anesthesia is performed by a pair of nurses assigned exclusively for that purpose. They are nurses who underwent training in Thailand. In many cases, only one surgeon was assigned to an operation, and the operation was performed with the assistance of nurses. Wound closure is performed by nurses, and according to their explanation, they learn the techniques by watching the procedures as OJT in the operating room. It turned out that the issue of shortage of doctors is addressed by assigning various roles to nurses with specialist skills. The nurses with high specialist skills were working enthusiastically.

In the operating room, the communication among members working together is very smooth and the atmosphere is also positive. However, hand hygiene is not completely practiced, patients enter the room with bare feet, and there were no personnel who took control of the entire operating room, which are points that should be discussed for improvement. Chief nurse Matsuyama gave a lecture on these points. About 50 medical staff members including anesthetists attended this lecture and they presented many affirmative opinions.

The next week, I worked in the ICU. There were 4 beds in the ICU and HCU, respectively, and almost all patients were on ventilators. There are no restrictions on the visiting hours, and oral care, aspiration, assistance to maintain body cleanliness, sheet exchanges, and postural changes are all performed by patients' family members in collaboration with the hospital staff. They brought enteral foods at an appropriate temperature by the time of administration. To my surprise, most of the patients' family members who provided such care were male, and they were mostly biological siblings but also included many siblings-in-law. According to the explanation, guidance on how to make preparations and take care of patients is provided on a specific day of the week. I was impressed by the tight family ties as patients' family members appropriately transferred the tasks from one member to another when they switched the role of attendant from one to another.

In the ICU, both doctors and nurses almost completely complied with hand hygiene. The environment was very clean, as it was cleaned by all nurses once a day in the morning. The nurses in the ICU also included many young nurses with only a few years of experience, but they were all very observant and responsive and it was hard to imagine that they had only 1 to 2 years' experience. When I asked them, these nurses said that they had been trained in Thailand, as I expected.

In the ICU, all patients are placed on a ventilator, and many patients undergo tracheostomy, unless extubation is possible. However, unlike the situation in Japan, there are no systems or hospitals where patients can receive

Care at the ICU

Conference with ICU doctors and nurses

rehabilitation in Bhutan, and I therefore made proposals by giving a lecture on early interventional rehabilitation. The proposals included a recommendation to provide guidance on rehabilitation methods to patients' family members because they have strong family ties. Although it may be difficult to achieve it straight away, the chief ICU nurse said, "Let's continue such exchanges." I hope that my proposals will help them in the future.

Issues noticed during the activities

I felt that, basically, things are lacking in the ICU. Air mats had been introduced because there were many patients requiring postural changes, but only one pillow per patient was available. Since pillows could not be used for the lower limbs, it was difficult to explain about positioning. I also received a request for new clipboards (boards used to hold the flow charts) because the boards that had probably been supplied by Japan were old.

In addition, no towels, paper towels, etc. were available for use after hand-washing in the operating room or ICU. The ICU was equipped with a hand dryer, but it was sometimes not functioning, and I did not know what to do then.

Accomplishments and results of this dispatch

Since the present dispatch period was as short as 3 weeks, it was meaningful that I worked while learning about the actual situation and discussing proposals in partnership with chief nurse Matsuyama. Even in the same situation, we do not always have exactly the same views. I strongly felt that discussing what we feel would allow us to learn more. I also realized that things are very simple and go efficiently both in the operating room and the ICU. Although I could not confirm that our proposals had soon been put into practice, I hope that they will provide good opportunities for improvement in the future.

Our activities will become more meaningful if a system for cooperation with JICA staff members, who are dispatched for a longer period of time to provide medical assistance, is organized.

Overall impression of the present medical assistance activities

This was the first time for me to visit Bhutan. Since I had never thought I would have such an opportunity for medical assistance activities, I really thought deeply about the offer, because I only felt anxious and confused. Finally, I decided to accept the offer with the encouragement of others.

My anxiety was gone as I could work with chief nurse Matsuyama. I appreciate the proposal by Dr. Okajima.

In the operating room, the communication was smooth and the atmosphere was also positive, and the local staff welcomed us very favorably. By watching them performing operations one after another with excellent communication and teamwork in front of me, I felt the importance of communication anew. They concentrated very hard on their work during the 6-hour on-duty period, possibly due to the absence of overtime pay.

In the ICU, the atmosphere was initially somewhat tense compared to the operating room, but the local staff were friendly toward Japanese, because a JICA staff member had worked there for the previous 2 years, until immediately before we arrived there. Since this was the first time that staff of Kyoto University Hospital provided medical assistance in the ICU for the short period of 3 weeks, the local staff might have been confused about our presence in the beginning. As they invited us to have lunch together, we could talk to them, and after that, some local staff members frequently talked to us. Thus, it was possible to obtain their understanding by giving lectures to clearly show what we are thinking from an early stage, and to fit in with them by performing bed-side care together. The care was basically the same as ours. The chief nurse in the ICU had retained various kinds of information in the form of data. The chief nurse there would like to absorb new information coming from outside, and therefore gave me opportunities to lecture. I really appreciate that. (I would also like to thank chief nurse Matsuyama and Dr. Kashiwagi who covered my bad English in the lectures.)

Both in the operating room and the ICU, nurses had high specialist skills and were working with confidence. They explained that they had been trained in Thailand. I was very interested in what kind of training they had received. I have not seen senior nurses imposing tough guidance on junior nurses in the operating room or the ICU, which may have a lot to do with the training they had received. This may be a national characteristic of Bhutan, but I would like to emulate them. I would also like to formulate a future educational plan for young nurses so that they will be able to work enthusiastically and with confidence.

Regarding the present dispatch, I would like to thank

the staff of the Nursing Department, including director Igawa and deputy director Matsuno who chose me, and the staff of JDW Hospital who welcomed us. I would also like to thank chief nurse Uno who approved the dispatch from the CCU and who coordinated the work shifts, deputy chief nurse Takekado, who took charge of all duties of the deputy chief nurse during my absence, and all CCU members who cooperated to perform the bed-side care duties. I also had to be absent from work in the LVAD outpatient unit. During this period, chief nurse Mitomi and the staff of the 4th floor of the outpatient unit also cooperated taking extra effort. I would like to thank them all. In closing, I would also like to thank all other individuals who encouraged me when I was anxious about the dispatch.

Lecture

Photo with anesthetists and nurses