

Pharmaceutical Delivery by Home Visitation for Children Undergoing Medical Treatment: Bringing Healthcare and Enabling Educational Opportunities for All Children

Fukuoka Hoken Kikaku Chidori Pharmacy: Yumi Yahiro, Mika Kinoshita, Noriko Kobayashi

Background and objective

The number of children who need daily medical care is increasing year by year in Japan (Fig. 1). This increase is attributed to the development of neonatal and maternal-perinatal care, which has saved the lives of many newborns. However, as a result these children require daily procedures such as ventilator management, suctioning, tube feeding (gastrostomy), and central venous nutrition.

The Japanese "Medical Care Child Support Law" enacted in 2021 mandates that the national and local governments provide resources and support to children and their families who need daily medical care. In order for these children to have active lives and receive education, it is essential to support them with pharmaceutical visits to their homes.

Even before the mandate, in 2004 Chidori Pharmacy installed an aseptic room and clean bench in the pharmacy and has been preparing and delivering intravenous infusions to patients who require 24-hour I.V. (Fig. 2).

In this presentation, we describe the case of a child who needed daily medical care, and how the pharmacy was able to take extra measures to help her attend elementary school.

Why is aseptic dispensing by pharmacies necessary?

- In the case of patients who cannot be treated with ready-made high-calorie I.V. infusions (e.g., children), it is necessary for a healthcare professional to mix the solution.
- In practical terms, it is difficult for a home care nurse to visit the patient's home every day to prepare the infusion.
- In order to allow patients to stay home and not need to be in the hospital, bulk regulated infusions that will last for several days must be aseptically prepared in a clean room.

Fig.1 ref 1)

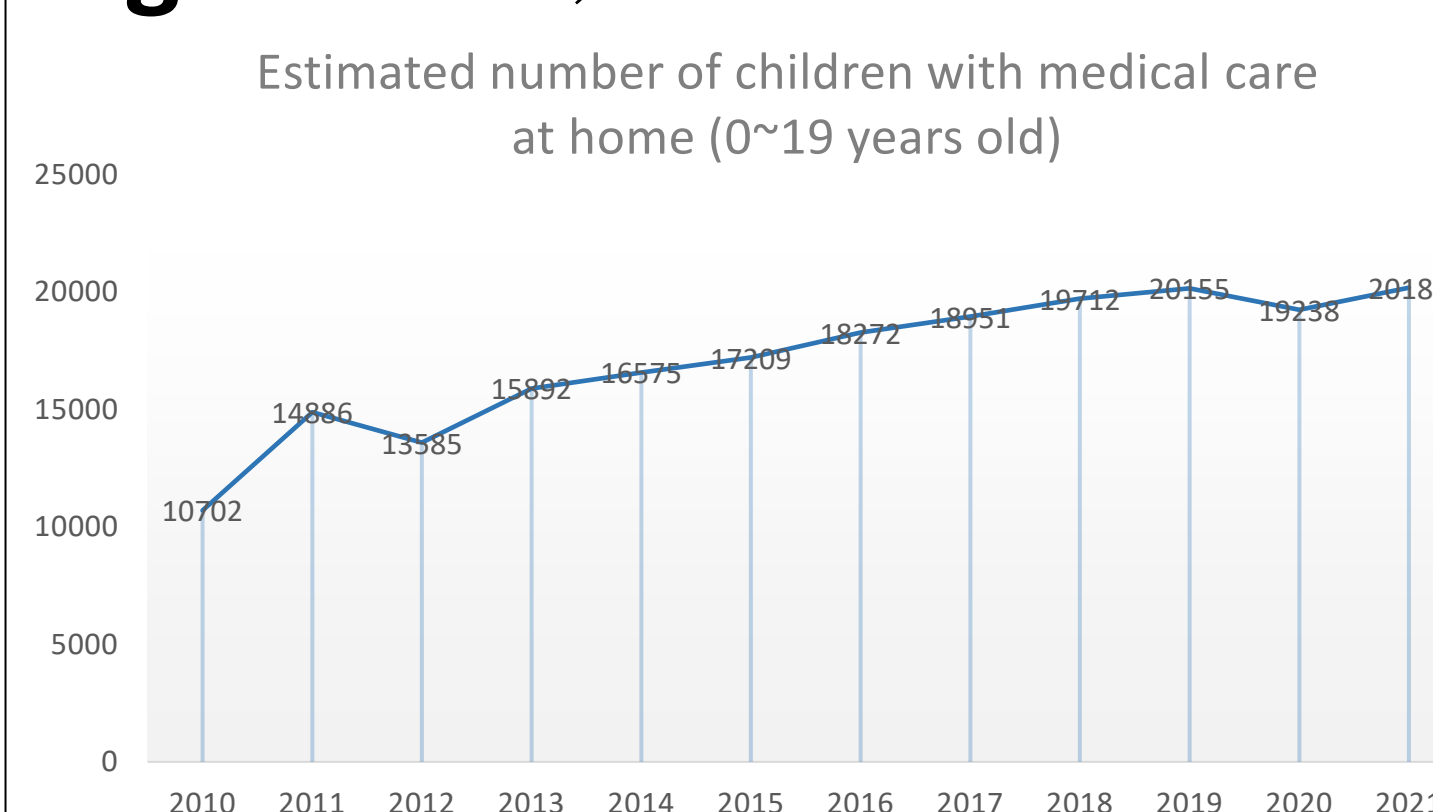
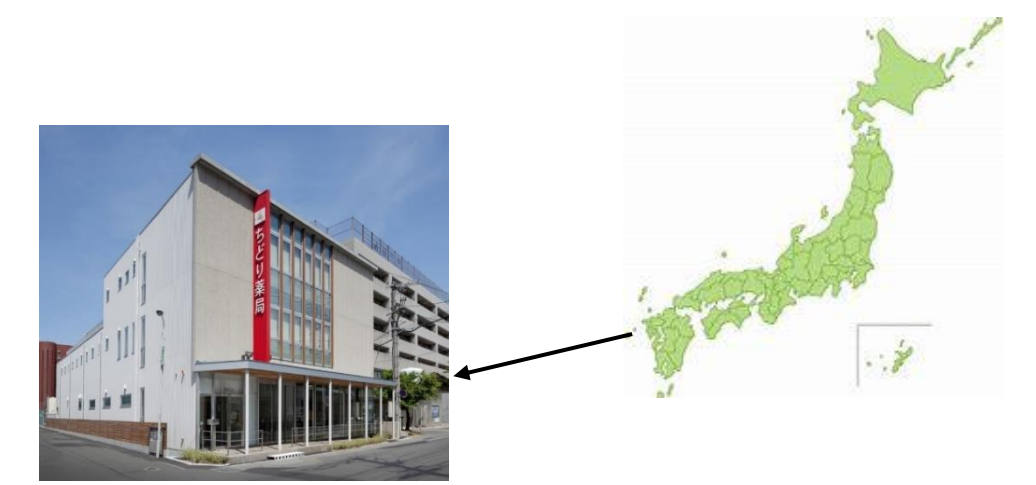


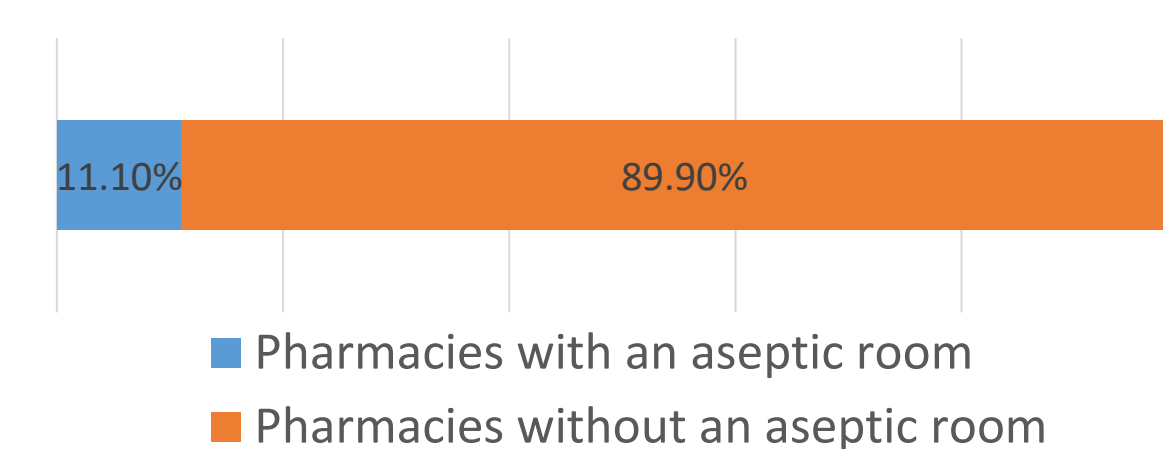
Fig.2

About Chidori Pharmacy

- Address: Chiyo 5 chome, Hakata-ku, Fukuoka City, Fukuoka
- 21 pharmacists on staff
- Open all year round
- Home pharmaceutical delivery and aseptic preparation rooms are available.



Percentage of pharmacies with aseptic drug product processing facilities



Although the number of pharmacies with aseptic rooms is increasing, they are still few in number. ref 2)

Methods/intervention

Patient T.A. (currently 11 years old, female)
Name of disease: Microvillus inclusion disease

Medical History

The patient had severe diarrhea from the time of birth with a body weight of 3.25kg and was hospitalized until around 7 months of age. After discharge from the hospital, the aseptic prep team at Chidori Pharmacy began preparing high-calorie infusions twice a week and providing drug visits (Method 1).

At the age of 6 with a body weight of 9 kg, she entered elementary school while on 24-hour infusions (Method 2). At this time, complications such as liver dysfunction and cirrhosis due to long-term administration of high-calorie infusions were observed.

At the age of 7, she was told that her life expectancy would be short without a liver transplant. Liver and small intestine transplants were considered.

At age 8, she received a liver transplant from a family member. About three months later, a small intestine transplant from a donor was successful.

At the age of 9 and at a body weight of 12.5kg, an enterostomy and a colostomy were performed.

About 5 months after the small intestine transplant, she resumed going to school. She is now able to take nutrition orally.

Now, at the age of 11 and a body weight of 15.5kg, she is taking immunosuppressive drugs and attending elementary school in good health. (Method 3)

What is microvilli inclusion disease?

An autosomal recessive genetic disorder that causes massive watery diarrhea due to the inability of the microvilli of intestinal epithelial cells to localize normally to the luminal side of the intestinal tract.

Because the absorption efficiency of enteral nutrition is extremely poor, people with the disease are highly dependent on intravenous nutrition, and require nutritional management with special attention to hepatic and renal disorders.

Method 1. Aseptic Preparations

- Aseptic preparations and drug visits occur twice a week from 7 months to 8 years of age.
- Support is given for delivery plans during travel and return visits. (Right: prescription details around age 3)

The adjusted infusion solution should be used within 7 days in cold storage

24:00~8:00
Rehabix K2 Injection 270ml
PLEAMIN[®]-P Injection 150ml
Sodium Chloride Corrective Injection 1mol/ml 20ml
Otsuka Glucose Injection 50% 60ml
Heparin Sodium Injection Mochida 5000 units/5ml 0.5ml
Multamin Injection 0.25V
Vitacimin Injection 4ml
Metaborin Injection 2ml

8:00~18:00
Physio35 500ml
Medrenic Injection 0.7ml
Sodium Chloride Corrective Injection 1mol/ml 20ml

Method 2. Prescription Planning

Problems and Solutions regarding Elementary School attendance

Heavy infusion

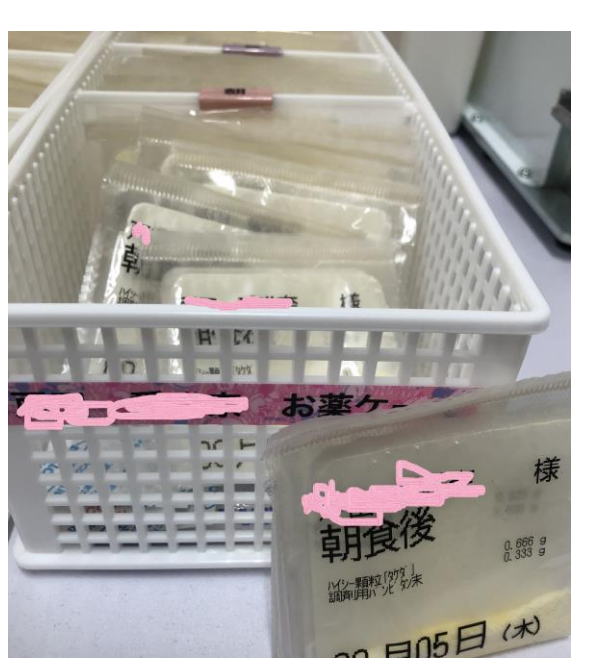
We suggested a new prescription to make the infusion less heavy while she was in school and split it so that she could carry it on her own back.

22:00~8:00 (500ml mixed)	8:00~15:00 (500ml mixed)	15:00~22:00 (500ml unmixed)
22:00~8:00 (500ml mixed)	8:00~11:30 (250ml mixed)	11:30~15:00 (250ml unmixed)
		15:00~22:00 (500ml unmixed)

Infusions are changed when the school nurse is available.

Method 3. Intake Medicine Preparation

- Suggested organization methods on how to set and manage oral medications after transplant surgery sorting by date/application, light/moisture shielding, cold storage, etc. Home visits occur twice a month.
- After the patient's transplant surgery, there are more than 15 different oral medications that need to be handled with care by the pharmacist. Pharmacists must crush the tablets to set the dosage according to body weight, prevent contamination, and prepare each medicine individually to avoid undesired reactions in the composition. We also provide a guidance on hydration to prevent dehydration.



Conclusion

With the increasing number of children with medical complexity today, we must support their daily lives by providing them with specially prepared infusions, planning prescription schedules, home visits, and preparing complex medications. Pharmacies can help bring health and education equality to children who need daily medical care by strengthening partnerships with the community and promoting home visits.

References

- 1) Ministry of Health, Labour and Welfare website Support measures for children with medical care and their families
- 2) Based on the March 2023 NPhA Managing Pharmacist Questionnaire Report.

Contact: chidori@fhkph.co.jp