

Performance features of hospital nurses in multidisciplinary rehabilitation team for the patients undergoing cytostatic therapy and hematopoietic stem cell transplantation

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Summary

Efficiency of hematopoietic stem cell transplantation and accompanying therapy in the patients with hereditary and malignant diseases of blood system depends, e.g., on timely and sufficient treatment and rehabilitation programs. At all stages of the therapy performed, key role belongs to medical nurses. Therefore, education and training of highly skilled and motivated nursing

staff is required, due to implementation of new specialty "medical nurse for rehabilitation" in Russia since 2020, arrangement of rehabilitation departments and centers with multidisciplinary medical teams (MRHT).

Keywords

Hematopoietic stem cell transplantation, rehabilitation, nursing care.

Introduction

Over last years, novel medical technologies are developed for treatment of oncological diseases resulting into better survival rates [1, 2]. However, current therapies, e.g., surgery, irradiation and chemotherapy followed by hematopoietic stem cell transplantation (HSCT), and, more recently, targeted immune therapy, are causing common complications which may decrease quality of life in the long-term survivors. Along with supportive care, sufficient attention is given to rehabilitation programs aimed for prophylaxis and restoration of impaired body functions, psychological compensation and social adaptation [3].

To regulate the standards of rehabilitation treatment, aiming for better quality of medical aid, recently several orders

were issued by the Russian Ministry of Healthcare: "On approval of the Medical Rehabilitation Procedure in Children" No. 878n of 23.10.2019 (effective since 01.01.2021) [4] and "On approval of the Medical Rehabilitation in Adults" No. 788n of 31.07.2020 (effective since 01.01.2021) [5]. Subsequently, due to sufficient role of medical nurses in rehabilitation programs, the Russian Department of Labor and Social Protection has issued an order "On approval of a Professional Standard of a Hospital Rehabilitation Nurse" No. 476n of 31.07.2020 [6].

First of all, current rehabilitation concept suggests assessment of the rehabilitation diagnosis based on general somatic status of the patient, in order to determine the purpose for rehabilitation and to arrange appropriate treatment plan. To fulfill these tasks, a multidisciplinary rehabilitation

team (MRHT) is established, being managed by the specialist for medical rehabilitation. The rehabilitation care may be provided at different treatment stages. However, specific care features exist for outpatient department, hospital, and day-patient facilities, depending on diagnosis, age and treatment mode in the given patient.

Hereditary and malignant blood disorders, as well as appropriate treatment, critically affect all aspects of the patient's life including physical and psychical welfare, changes in diet, social and cultural habits, cancel their scholarship, labor activities, thus dramatically changing lifestyle and status and hampering their social adaptation.

There are additional features in oncohematological patients including immune deficiency, infectious conditions, thrombocytopenia, along with a number of other potential complications accompanying cytostatic therapy and HSCT. These conditions require special competences from medical staff involved in the rehabilitation programs. Crucial attention should be given to timely initiation of rehabilitation program, and cooperation with all the patient's relatives. Therefore, medical rehabilitation in HSCT clinic should be based on the principles of complex approach, continuity and individual approach to the patient.

The aim of present publication is to gain interest for hospital nurses to this novel direction in nursery, taking into account high demand for highly skilled specialists in this field of medicine.

Arrangement and main rehabilitation programs following chemotherapy and HSCT

Significance and role of medical rehabilitation at the present stage of healthcare development in Russia, is currently defined legislatively, i.e. by article 40 of Federal Law No. 323 of 21.11.2011 "On the Basic Health Protection Principles of Russian Citizens". In this respect, hospital nurses should play a sufficient role in arrangement of medical rehabilitation since they provide immediate care to the patients most of their worktime, having more detailed information on their emotions, demands and potential requirements.

According to current regulatory acts, specialization for the Rehabilitation Nursery is accessible for the hospital nurses with secondary education in Nursery, Medical Care, or Obstetrics.



Figure 1. An example of visual analogue pain intensity scale

Hospital nurse, as a member of MRHT, should, except of common duties, use her (his) skills and competences in order to execute the following functions:

- fulfilling medical administrations of attending physician;
- detecting medical and psychological problems, social demands of the patient;
- evaluating pain syndrome;
- consulting the patient and accompanying persons on nutrition issues, as based on the physician's recommendations;
- preparing the patient for rehabilitation procedures and lending support to the attending physician;
- performing rehabilitation procedures and nursery duties when keeping anti-infectious safety for the patients and staff.

The main areas of rehabilitation in hemato-oncology include pain management, arrangement of nutritional care, physical therapy, psychosocial aid, physiotherapy (less common), as well as assistance in process of education for pediatric patients, especially, during long-term treatment (several months and more).

Special area of medical rehabilitation includes quality of life improvement methods, and increased overall survival in palliative medicine which is now considered from the period of primary diagnostics, not only as the end of life care [7].

Pain diagnostics and management

Pain represents an unpleasant sensory and emotional experience associated with actual tissue injury. In hemato-oncological disorders, ossalgias are most common, as well as pain associated with mucositis, graft-versus-host disease, intestinal lesions, like as polyneuropathias. Pain management is performed by anesthesiologists and staff of intensive care unit, since it often presumes usage of opioids, potent drugs and invasive procedures, e.g. epidural anesthesia.

The duties of hospital nurse may include evaluation of reasons, time course and intensity of pain by means of verbal signals and visual-analogue scales, depending on the patient's age and conscience (Fig. 1). This also includes training for infusion pump handling, when the patient-controlled analgesia is decided (Fig. 2), efficiency analysis of the pain management and timely detection of its side effects.



Figure 2. Infusion pump with a button for the patient-controlled analgesia

Clinical nutrition

Inadequate nutritional status (cachexia, or obesity) is widely known to be an independent factor of unfavorable prognosis when managing the patients with oncological diseases [8]. In particular, gastrointestinal toxicity during chemotherapy and following HSCT are observed in 50-90% of the patients [9]. Abnormal taste, loss of appetite, nausea, vomiting and diarrhea are registered. Additional problems with maintenance of adequate nutritional status lead to dietetic limitations when administering low microbial diet, which is required to prevent infectious complications in immunocompromised and cytopenic patients. Therefore, evaluation of nutritional status and arrangement of feeding or special diets are the main items of rehabilitation performed by a specialist in clinical nutrition.

Medical nurse who works in the field of clinical nutrition, should participate in anthropometric procedures, instrumental examinations, e.g., bioimpedance measurements (Fig. 3) and indirect calorimetry (Fig. 4), evaluates individual nutritional records, performs enteral nutrition via nasogastric tube, or gastrostomy (Fig. 5), parenteral nutrition using central venous catheter, peripherally inserted central catheter (PICC-line), and subcutaneous port-chamber catheters (Fig. 6), educates the patient on the nutritional issues in home conditions.

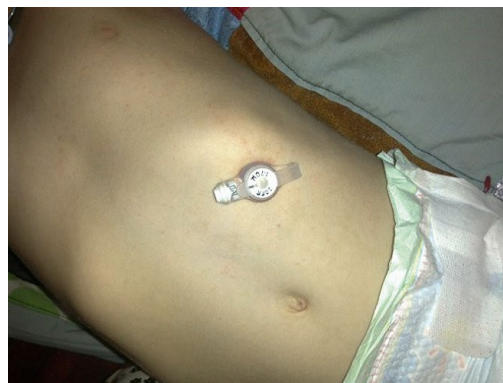


Figure 5. Percutaneous low-profile gastrostomy (Avanos, USA). Courtesy of A. N. Shvetsov

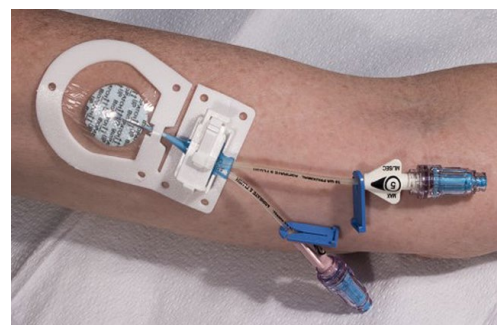


Figure 6. Peripherally inserted central venous catheter implanted in *v.basilica sinistra*



Figure 3. Bioimpedance measurement using BC-418 MA device (Tanita, Japan). By permission of N. G. Saltykova

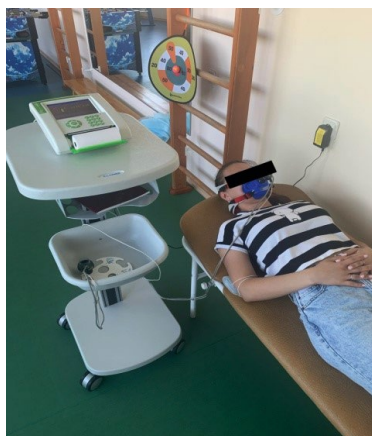


Figure 4. Indirect calorimetry performed *via* portable Fitmate pro (Cosmed, Italy). Courtesy of A. G. Volkova



Figure 7. Cardiorespiratory testing in a child (Courtesy A. G. Volkova)

Physical rehabilitation

Long-term hospitalization, bed regimen, poor well-being, pain syndrome and mangle of physical exercise lead to sooner loss of the lean body mass and rustiness, thus causing a decrease of adaptive reserves and have negative impact on the organ functioning, thus prolonging recovery terms after treatment. Physiotherapist and medical nurse are responsible for development and execution of individual program of physical rehabilitation based on the initial data of general somatic status, cardiorespiratory testing (Fig. 7) and current

performance of the patients. As a rule, a set of energy-consuming passive or active exercises, ergocycling, gym exercises and massage therapy are recommended after chemotherapy.

Psychological rehabilitation

Aiming for curation of the primary disease, improvement of objective indexes and laboratory data of the patients, especially children, it is a crime to forget about his emotional experience and maintenance of inner spiritual world. In this context, psychological aid is intended to support social and psychical adaptation of the patient not only at the current stage of disease and during treatment, but also for future lifestyle changes. Non-corrected fears and emotional reactions of the patients and relatives, reflecting type and intensity of psychical trauma caused by continuous stress, may exert negative impact, both during treatment, and in future life and activities.

Medical nurse can positively influence these processes, both by professional performance of her (his) duties, friendly attitude to the patient, and lending support to clinical psychologists, e.g., by means of specialized testing, questionnaire surveys and other methods of psychological monitoring.

Our experience in rehabilitation at the R. Gorbacheva Institute of Pediatric oncology, Hematology and Transplantation

Our hemato-oncological clinic disposes of all the required specialists for arrangement of MRHT. Until recently, however, they provided medical, psychological and educational support on separate basis, i.e., upon demand of attending physician. With respect to current trends of medical care, acting legislative regulations, upon accumulating experience in HSCT and immune therapy, in view of sooner opening a new Clinical and Rehabilitation Center at the First St. Petersburg State I. Pavlov Medical University, we now rearrange our rehabilitation service towards assessment of individual diagnosis and combined approach to therapy and, if required, schooling of the patient.

The MRHT members are jointly discussing and designing treatment plans, creating friendly atmosphere for the patient, they perform evaluation and correction of rehabilitation procedures and, further, educate their relatives for implementation of rehabilitative methods in the home conditions. Educational process for the patients attending school is performed successfully and at high methodological level, including distant teaching format.

Medical nurses play the key role in all the mentioned rehabilitation areas. Their job presumes both common clinical manipulations, and coordinating activities between other specialists and accessory services, in order to increase efficiency of therapeutic rehabilitation programs.

Conclusion

Medical rehabilitation is a new and highly demanded specialty in clinical nursery, thus, due to specific features of the patients with severe inherited and hemato-oncological

disorders, treated by chemotherapy and HSCT. These tasks require training of skillful and motivated medical staff members and place higher demands on potential candidates, with respect to their knowledge in theory and practical competences.

Conflict of interest

None reported.

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Особенности работы медицинской сестры в составе мультидисциплинарной команды при реабилитации пациентов, получающих лечение методом цитостатической терапии и трансплантации гемопоэтических стволовых клеток

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Резюме

Эффективность трансплантации гемопоэтических стволовых клеток и сопроводительного лечения у пациентов с наследственными и злокачественными заболеваниями системы крови зависит, в том числе и от своевременности и достаточности сопроводительной терапии и программ реабилитации. Ключевая роль на всех этапах лечебного процесса отводится медицинским сестрам. В связи с этим, наряду с внедрением в Российской Федерации с 2020 г. новой специализации «медицинская сестра по реабилитации», созданием отделений и центров реабилитации, мультидисциплинарных реабилитационных команд, требуется подготовка высококвалифицированного и мотивированного среднего медицинского персонала.

Ключевые слова

Трансплантация гемопоэтических стволовых клеток, реабилитация, сестринское дело.