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TeleHomeCare Project for chronic patients in PTA of Ceglie Messapica (BR) and the innovative telemedicine system used

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Abstract – The telehomecare Project was started to monitor from home patients with chronic diseases; the aim is to reducing hospital admissions and the lenght of bed-days in the hospital. The activities includes the involvement of hospital specialists, family doctors and professionals working in the area. At any time and in any place the doctor can monitor and communicate with the patient who is cared from home. It is thus also generated a psychic improvement of patient's condition. Through the use of an innovative technology called hospital at home all main physiological parameters of patients are monitored. The study set a number of primary objectives and other secondary objectives, and the first data obtained show very encouraging results as well as a highly appreciated by the operators involved (doctors, nurses, caregivers, etc).

Keywords – Telehomecare, teletherapy, teleconsult, copd, hear failure, diabetes, hospitalization.

I. INTRODUCTION

Ever more in recent years have seen a progressive increase in hospitalizations for chronic diseases, with a high rate of re-hospitalizations.

A lot of national and international experiences have shown that, in the presence of diagnostic and therapeutic care pathways, there has been a significant reduction of the hospital admissions and reduced costs as well as improved clinical outcomes.

Telemedicine has proved particularly useful in individuals with chronic conditions, helping to improve the quality of health care, allowing the usability of care, diagnostic services and remote medical consultation in addition to real-time monitoring 24 h of the main vital signs.

In July 2015 has been started in PDTA of the Ceglie Messapica (ASL BR), and directly to home patients, a telemedicin project, based on telemonitoring, teleconsult and teletherapy, called TeleHomeCare, aimed to patients with heart failure, COPD and diabetes.

The project is proposed as a technological support already structured the activities of home care with the main objective to affect favorably on the reduction of rehospitalization rate and improving the quality of care at the patient's home, also validating new telemedicine models applied for diagnostic and therapeutic pathways for the management of chronicity.

Patients, opportunely selected, are followed by their family doctors with by telemonitoring using the innovative technological instruments H@H Hospital at Home, able to detect the main clinical and instrumental parameters in addition to the therapeutic administration, based on oxygen and bronco-aspiration.

Patients are followed, using the care protocol provided by the project, which defines the times and methods of operation on to those who are suffering from chronic diseases at risk of instability, previously selected and cared for in the home care setting.

The project involves the use of 11devices called H@H Hospital at Home installed at home and into the Hospital of Ceglie Messapica, assisted by telemedicine technology.

The early data shows that to now are enrolled 30 patients (70% over 65), of which 12 COPD, 8 with heart disease; the data show that 25% of patients requires at least once a week oxygen therapy.

II. THE OBJECTIVES

The telemedicine project aims to implement a new type of monitoring of patients suffering of chronic diseases, based on continuous collaboration and patient monitoring, by different professionals and different users.

The aims of the study are different and first of all aims to intercept the instability phases before they reach the critical situation, reducing the rate of hospitalization, rehospitalization and activation of protected resignation.

In general, the project includes the following main objectives:

•Reduce the number of patients with heart disease, Chronic Lung Diseases and Diabetes in the process of instability;
•Reduce hospitalization and re-hospitalization;
• Activate protected resignation;
• Optimize the therapy and diagnosis according to international guidelines;
•To promote the integrated management of Hospital and Territory;
• Evaluate the satisfaction of the doctor, caregiver and patient;
• Evaluate cost/benefit of the project.

Primary end point

Check the possible use of technological devices for telemedicine within integrated management models between hospital and territory about chronic diseases with high social impact, in order to improve its management and to facilitate the integration between specialists and doctors.

III. SECONDARY END POINT

• Reduce the number of admissions;
• Reducing hospital stays;
• Activate protected resignation.

The Shares of the Project

TeleHomeCare project includes the monitoring of the clinical parameters, administration of therapy and the compliance with specific procedures of patient care, even at home.

The operational phase of the project involves:
Clinical-anamnestic Rating
Physical Exam
Measurement of the blood pressure
5-lead ECG
Internal and external body temperature
Heart rate
Respiratory Rate
Oxygen saturation SpO2
Aspiration endocavitary
Dispensing with oxygen concentrator
Rating of physiological parameters trend
Using the medical andnursing record
Adjustment of Therapy
Questionnaire on quality of life

IV. DATA ANALYSIS

TeleHomeCare project provides an analysis descriptive statistics of the data obtained; in particular, starting from theassessment of performance, referring to the endpoint, the study aims to obtain at the same time information useful to:

• Evaluate the reduction of hospital stay days for heart disease and COPD and diabetes and consequently the reduction the associated costs;
• Activate protected resignation;
• Confirm the improvement of quality of life, the psycho-physical health and motivation of patients and health professionals;
•Evaluate whether the telemonitoring activities, telecare and teleconsultation is related to an actual reduction in hospital admissions;
•Evaluate whether the project has enabled timely diagnosis of pathological conditions; in particular, it will assess whether the project activity ensured a reduction in pharmaceutical spending and the reduction of new hospital admissions.
•Declare whether the use of the concentrator has allowed savings related to oxygen consumption compared with average costs associated.
• Check the approval rating of health care professionals and patients (through the use of specific questionnaires).

V. CHARACTERISTICS OF THE TECHNOLOGY USED

The study involves the use of new technology called Hospital at Home, used at home of the patient also into the hospital.

The system will be designed with patient device, allocated at the patient's home, permanently interconnected with the doctor, by pc, telephone, tablet, etc. Also present at the hospital in Ceglie a central monitoring of all patients and all devices located at the patient's home. all clinical parameters of patients are stored on a dedicated server, respecting all the rules for the respect of privacy. The system permits to the doctor (neurologists, cardiologists, diabetologists, etc) remotely, to see the patient and talk to your health care professional on a visit to the domiciles of patients, through the activation of a video special device.

VI. THE SUPPORTING INNOVATION

Infact, in addition to real-time monitoring of physiological parameters, the doctor can monitor the physical and technical characteristics of the home device.

It is possible to deliver therapy to the patient, remotely. In particular, it is possible to deliver oxygen therapy and endocavitary aspiration. Doctor or health care professional determines the limit of the range of physiological parameter values and when the parameter is out of range, the system draws the operators attention through the alert. Also within the system there is a medical record that is possible to customize according to the categories of patients who are taken into care. The family doctor or specialist can talk to the patient or the caregiver because the system has a video communications system that allows the teleconsultation among multiple doctors or between several specialists. All the data are saved on the server at any time, operators can access the system and retrieve them, monitoring the patient and also viewing all trends of each parameter.

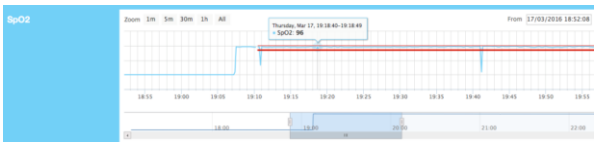

Fig.2 – SpO2 trend

The patient unit is constituted by a monobloc unit containing the totality of the monitoring and therapy devices, compact, of minimum overall dimensions, on wheels in order to be easily transportable.

Each station is equipped with a system for video communication with the control center. This system

includes a microphone screen and integrated HD camera.

Fig. 1 – Monitoring heart rate

The system for video communication is mounted on a support, of type "articulated arm" for ergonomic operating orientation of the device that is versatile and flexible, so as to enable the video call in any patient positioning condition, be it standing that bedridden.

The goal is to test the possible use of technological devices for telemedicine within integrated management models between hospital and territory for chronic diseases cardio-pulmonary and metabolic disorders, it will be evaluated through a questionnaire.

VII. CONCLUSIONS

The project involves the use of 11 devices called H@H hospital at home installed in the house of patients and at the Community Hospital of Ceglie Messapica (Br) allows to assist with telemedicine support approximately 120 patients/year. The preliminary examination of the data for the first half year with taking charge of n. 30 patients , allows to appreciate the effectiveness of remote monitoring system as well as detect a favorable judgment by referring patients to a better quality of ' assistance.

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