

# Use of Telemedicine in Pilot Centers within the Perinatal System

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**Abstract** – In the last decade of the twentieth century in many countries rapidly has developed telemedicine. Telemedicine is not a separate discipline within the health system, but a "transfer of information at distance regarding patient's medical care." In the Republic of Moldova telemedicine implementation into perinatal system started in 2009 in four pilot centers: MCRI (level III), CP Hospital no. 1 Chisinau, CP Balti and CP Cahul (level II). Thus the creation and development of this interdisciplinary network of teleconsultation and telediagnostic has followed the improvement of health care services quality and decrease of their costs, increasement of quality of patients life in perinatal system, orienting themselves to consultation of serious neonatal and obstetric cases from level II Perinatal centers. Although it's on its beginning, telemedicine network in the frame of perinatal sytem has already achieved success. Cooperation between specialists from levels II and III of perinatal care has strengthened, interactive work and multidisciplinary cooperation between obstetricians-gynecologists and radiologists, imagists have strenghtened also.

## I. INTRODUCTION

In the last decade of the XX<sup>th</sup> century the Telemedicine has rapidly developed in many countries. Telemedicine is not a separate discipline within the health system but a „transfer at distance of the information regarding medical care for a patient”. Telemedicine represents a potential to improve medical care worldwide through the diversification of medical services which will be offered to communities and individuals who do not have the access to these services, both from urban and rural areas. In addition, Telemedicine can help to attract and retain in rural areas health professionals in the medical field via continuous education and collaboration with other professionals in the field from other centers (tertiary, educational [1,2,3].

## II. MATERIAL AND METHOD:

In the Republic of Moldova the implementation of the Telemedicine into perinatal system started in 2009 in four pilot centers: MCRI (level III), PC Hospital nr. 1 from mun. Chisinau, PC Balti and PC Cahul (level II). Thus, the creation and development of this interdisciplinary network of telediagnostic and teleconsultations aimed to improve quality of health care and to lower their costs, to increase the quality of patient's life from perinatal system being oriented to the consultation of neonatal and obstetrical cases from II level perinatal centers. This component of the Project offers a possibility to consult, make diagnosis and carry out medical trainings at distance for all medical staff within the perinatal system between III level institutions and II level pilot centers with the help of lecturers from the Medical University "Nicolae Testemiţanu"; unclear or difficult cases must be consulted with specialized clinics from abroad. Thus, the pilot institutions, where 40% out of total number of deliveries take place and where severe newborns and premature babies are concentrated, have been identified during the *first stage*. The number of working places from wards and NICU from pilot institutions has been identified. 16 computers with web cameras, color printers, scanners and digital cameras have been procured to document data for clinical cases as much complete as possible, later 3 more notebooks were procured for presentation of newborns, of

VAP and SiPap parameters, monitors within the consultations with II level pilot centers.



Fig.1. The Telemedicine system within the perinatal system of the Republic of Moldova

The Telemedicine's implementation was approved by the MoH Order nr.285 from 18.08.2009 "On implementation of Telemedical consultative system in perinatal pilot centers" in 4 pilot centers: MCRI (level III), PC Hospital nr. 1 from mun. Chisinau, PC Balti and PC Cahul (fig.1). According to this Order, the list of specialists who will activate as consultants from the Departments of Obstetrics, Gynecology and Neonatology from the Medical University "N. Testemiţanu" was created. Also, through the telemedicine

system the MCRI, level III perinatal center within the regionalized system, carries out consultation of severe neonatal and obstetric cases from level II perinatal centers. Unclear and difficult cases from MCRI are consulted with the specialized clinics outside the republic. During the *second phase the obstetric and neonatal cases* needed to be placed at the iPath platform were identified.

This platform for Telemedicine was designed for the Republic of Moldova to facilitate the exchange of information and communication between professionals working in health sector providing the following functionality: creation of discussion groups on various health topics being a link of continuous education to perinatal system. National working group together with consultants from Switzerland have identified and created four working groups that are placed at local international platform iPath:

- Test group
- Perinatal Health
- Regional Group (Moldavian-Romania-Ukrainian)
- Health Technologies Management

Initial areas of users' interest are Telemedicine in perinatal system and Health Technology Management; within each of the discussion group the members can: present and discuss cases (medical) in order to exchange information and opinions, organize consultations at distance via which the specific cases are presented to colleagues to provide a second opinion.

On this platform the following specialists are registered: obstetricians/gynecologists, neonatologists, radiologists, pathomorphologists, traumatologists and other professionals. Currently, the Telemedicine system in perinatal system offers us:

- 1) *Teleconsultations* in specialization of obstetrics and neonatology (during 24 hours)
- 2) *Teleradiology* - on-line consultation of radiological images during 24 hours;
- 3) *Teleducation* - training for specialists at distance.

### III. RESULTS:



Fig.2. On-line consultation at distance via iPath network by III level specialist, consultation of neonatal case from PC Balti

The Telemedicine System within perinatal service is the first unit in the country where the teleconsultations, investigations of patients at every level of the country are practiced effectively and can easily be followed and interpreted on-line by specialists from III level, where consultations at distance via audio-video connection are provided. After the birth of a severe baby in one of II level Perinatal Centers, the specialist from the territory during the first 2 hours comes into contact with one of the consultants from the level III (MCRI), the consultation is provided on the basis of audio-video communication, as well as via tracking of health indicators ( $P_s$ ,  $TA$ ,  $FR$ ,  $SaO_2$ ), laboratory

examinations data exposed in the questionnaire of Perinatal Health group, as well as of Rx examination data or other investigations placed at the iPath platform. Diagnosis is made in real time by doctors-consultants who decide which must be the tactics of investigations, treatment or where the patient must be transported to receive the appropriate treatment as soon as possible. During the past year, specialists from the second level pilot centers have benefited from consultations of images (radiography and USG).

Weekly the teleconferences of neonatologists from the pilot institutions are held in the morning: every week on Tuesday and Friday doctors from all departments of the MCRI take part in these conferences, the cases are presented briefly in a narrative form, the results of investigations are reported, then it is made the contact with NICU from pilot PCs (Hospital No.1, Balti and Cahul) which present severe and complicated cases that took place over a week and have been placed at iPath, there is a possibility to show the baby via video at notebook. A positive factor is the participation of doctors from pilot centers in these clinical conferences, those who are present have the opportunity to ask questions, to express their opinion on the diagnosis and treatment of patient, thereby increasing the quality. Next is the description of the pilot centers' experience in use of iPath platform. During this period of time, until 01.03.2011, 163 of users became registered at iPath platform, out of them: obstetricians-gynecologists 79 (49%); *neonatologists* – 48 (20%); doctors-imagists – 3(2%); other professionals – 33 (29%). In 2010 over 300 of emergent Telemedicine calls took place, all from 3 II level PCs from the country (PC Hospital nr.1 from Chisinau, PC Balti and PC Cahul).

In the frame of the Working Groups 376 cases totally were registered on the platform:

1. Group Perinatal Health – 330 (305 clinical cases + 25 information).
2. Test group – 40.
3. Regional Group (Moldavian-Romanian-Ukrainian) in Perinatal Health –
4. Health Technologies Management – 41 (instructions, guidelines for users, regulations, forms which are elaborated in clinical departments to ensure the equipment's maintenance).

Out of 376 of cases placed on the platform the specified are the following: obstetric cases – 79(21%); *gynecological* – 1(0,26%), *neonatal* – 270 (72%), *pediatric (sugar)* – 1(0,26%) and other information (guidelines, protocols, traduced articles ) - 25 (7,0%).

There were comments placed for 223 cases (63, 7%), those confirming the diagnosis - 92%, treatment – 90%, and medication– 91%. Thanks to teleconsultations offered to patients from II level pilot centers, especially from the Balti Perinatal Centre and Cahul Perinatal Center, the transportation of patients to level III has decreased by 30%, thus reducing the costs for newborns transportation to III level and travelling of specialists within AVIASAN service. In Phase III (2011) the Telemedicine service will be extended to other II level perinatal centers, which will be equipped with audio-visual equipment and Internet connection.

### IV. CONCLUSIONS:

1. Although it is on its first stage, the Telemedicine network within perinatal system has already achieved the success.

2. The cooperation between specialists from II and III level of perinatal care, multidisciplinary collaboration and interactive work of obstetricians-gynecologists, radiologists and imagists have been strengthened.
3. The educational part has improved – the level of knowledge has increased (precision of diagnosis, treatment) and, as a result, practices and quality of care were also improved.
4. Motivated by a continuous desire to increase effectiveness/costs, we succeeded that the teleradiology became a significant part of everyday practice.
5. Telemedicine ensured saving of time and financial resources provided for necessary transportation (has minimized the number of travelling of Aviasan specialists for consultation of case).

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