Regional Centre for advanced laser therapies in Ophthalmology

3. The relevance of the project for the implementation areas

The aim of the proposed project is to set up a centre of excellence between Timisoara and Nova Crnja, regarding the use of the latest, complex laser therapies in Ophthalmology: "Regional Centre for advanced laser therapies in Ophthalmology".

Timisoara has an excellent geographic position in the western part of Romania, very close with the Serbian border. Historically, Timisoara was a cultural and educational center for an area which is covering around five counties in Romania and a similar correspondent region in Serbia. Also there is a well-known cosmopolite trend of life of the people from this area, where Romanians, Germans, Hungarians and Serbians are living together as a strong community. Giving this connections in Timisoara, there is also a strong scientific network with many European countries.

The transportation facilities in Timisoara and mainly the international airport are also contributing to the extended relations with different parts of the Europe and are a strong argue to set the Center here, for a better coverage of the entire region.

The "Victor Babes" University of Medicine and Pharmacy Timisoara has been a recognized center of education for students from Romania or abroad since its foundation. There is a strong involvement of the University also in educating residents and specialists by setting different programs of training. The quality of this kind of activities increased progressively in the last years due to the high professionalism and commitment of the university staff and also to the high technology equipment which was bought. Keeping updated with the newest technology is a continuous concern of the University of Medicine and Pharmacy Timisoara, because only raising the standards could maintain the high level of recognition and also the high level of medical education.

According with this reasons, the project of developing a "Regional Centre for advanced laser therapies in Ophthalmology" is willing to deliver high technology services both for patients and doctors from Romania and Serbia, covering an equivalent geographic area from the western part of Romania, respectively the north-eastern part of Serbia.

This center will be unique not just in the cross-border area, but also in this part of the Europe, being able to offer high quality medical services and specific laser treatments, for Romanian and Serbian patients, regarding the targeted corneal and retinal pathology. The center equipment has to be on the latest generation, keeping in mind that the diagnosis imaging devices and the lasers themselves are continuously developing. Another important part of this project is to establish in the Serbian cross-border area a regional centre for laser therapy aiming the ocular complications of Diabetes – Diabetic Retinopathy, treatments provided by the Serbian ophthalmologists.

The main areas which will be covered by the center activity will be diabetic eye disease, corneal and retinal pathology.

Diabetes is a chronic disease, a lifelong disorder from it's onset. Given the improvement in medical care and increase in life expectancy, diabetes requires ongoing management. In the long-term, diabetes is associated with: cardiovascular disease, neuropathy, nephropathy, retinopathy, increase in morbidity and mortality, significant reduction in quality of life. Diabetic Retinopathy (DR) is a progressive condition and a major cause of

permanent vision loss. Almost all patients with type 1 diabetes mellitus and ~60% of those with type 2 diabetes mellitus have retinopathy by the second decade after diagnosis. It is an important disease because: typically, it's the first microvascular complication, loss of visual function may be presenting diabetic symptom, most people with diabetes will eventually develop DR, diabetes patients are screened for DR at diagnosis and at regular intervals, screening programs could identify early the disease, when identified, DR can be managed to reduce the risk of loss of visual function. Diabetic Macular Edema (DME) is a common complication of both non-proliferative and proliferative diabetic retinopathy which affected the central vision. If untreated, DME can lead to severe visual impairment. All over the Europe there are around 54 milion diabetic patients, around 18 milion of them have diabetic retinopathy and 6 milion of this ones have diabetic macular edema. The incidence and prevalence of Diabetes in Romania and Serbia is much higher comparative with the central and northern part of the Europe. Probably the number of diabetic patients in the reference area is around 400 000. Speaking about the treatment of diabetes ocular complications there is no doubt that laser photocoagulation is the gold standard. The Diabetic Retinopathy Study (DRS) demonstrated a 50% reduction in severe visual loss in eyes with proliferative diabetic retinopathy (PDR) that had received pan retinal photocoagulation (PRP). In the Early Treatment Diabetic Retinopathy Study (ETDRS), focal/grid photocoagulation reduced the risk of moderate visual acuity loss for eyes with clinically significant diabetic macular edema by about 50%. There are may kinds of delivering the laser energy to the retina nowadays and the Center from Timisoara is willing to get involve in detecting and setting the best procedures and protocols for diabetic patients.

Other retinal pathologies which will be addressed by the Center are retinal vascular diseases like central and branch retinal artery or vein occlusions, central serous chorioretinopathies, ocular tumors and age-related macular degeneration. The prevalence of this diseases is around 2-3% in the general population. There are new laser procedures available to successfully treat them and the Center will manage the patients with these problems.

The corneal pathology consists mainly in refractive errors and corneal ectatic diseases. The diagnosis of this kind of pathology has the same importance as the treatment.

The distribution of refractive errors changes with age. Newborns average 3.00 D of hyperopia. This may increase slightly in the first few months, but then it declines toward an average of 1.00 D of hyperopia by 1 year of age. Fewer than 5% of infants have more than 3.00 D of hyperopia at age 1 year. Myopia typically appears between 6 and 12 years of age, and the mean rate of progression is approximately 0.50 D per year, based on studies of mostly Caucasian children. Astigmatism in children is commonly oriented with the steep axis vertical ("with the rule"). In olderadults, astigmatism oriented with the steep meridian horizontally is more common ("against the rule") and remains relatively stable in older adults. Individuals with high refractive errors are more likely to develop pathologic ocular changes over time. Highly myopic patients have an increased incidence of progressive elongation of the eye with progressive retinal thinning, peripheral retinal degeneration, retinal detachment, cataract and glaucoma. An increased risk of glaucoma and visual field defects with myopia has also been found. An increased risk of developing primary angle-closure glaucoma among individuals with hyperopia has been reported.

The major reasons for treating refractive errors are to improve a patient's visual acuity, visual function, and visual comfort. Other reasons for treatment include enhancing binocular vision (e.g., for driver safety), controlling strabismus (e.g., accommodative

esotropia), and, on a societal level, preventing economic productivity loss associated with uncorrected refractive error.

The main technical procedures for correcting the refractive errors are laser mediated. Nowadays the femtosecond lasers and the excimer ones working together in synergistic platforms are able to offer the best solutions for young people in distress induced by refractive errors. There are different techniques (PRK, FemtoLasik, Smile) and the Center is willing to identify the best procedures and protocols according in this field.

The corneal ectatic diseases like keratoconus and pellucida marginal degenerations represent mainly a diagnosis challenge, so the Center wants to get the newest imaging devices (corneal topographs, corneal tomographs, Placido discs combined with slit-lamp scanning devices or Scheimpflug cameras) in order to be able to refine the accuracy of the diagnosis of this diseases.Screening will be a very important component of the Center activities. Keratoconus is a degenerative, non-inflammatory condition of the cornea characterised by a progressive thinning of the central and paracentral stroma and by a conical thinning (or ectasia) of the corneal profile, resulting in an irregular myopic astigmatism. This deformation is a progressive condition that can evolve very rapidly or slowly over the years. It often affects both eyes (90-95% of cases), but as the onset may be different in different eyes, only one eye may be initially affected by the condition. The prevalence of this disease in the general population is approximately 1/2000. The progression of keratoconus is not, unfortunately, predictable and can evolve to the point of requiring a surgical solution. In these cases, which represent about 20% of the most severe forms of keratoconus, cornea transplantation becomes necessary (keratoplasty). There are different techniques available like corneal cross-linking, lamellar or penetrating keratoplasties femtosecond laser mediated. The Center wants to be able to offer the best therapeutical solutions for the patients with this pathologies.

The project is addressing also to the doctors from both countries (Romania and Serbia) by organizing specific training activities for the romanian and serbian ophthalmologists regarding the use of new laser therapies for corneal and retinal pathology (keratoconus, myopia, hypermetropia, astigmatism, diabetic retinopathy, central serous chorioretinopathy retinal vascular diseases and age-related macular degeneration), using the “train the trainers” concept. The training activities will also be covered by leading European specialists (from Germany, UK, Switzerland) in ophthalmic laser treatments. The “Regional Centre for advanced laser therapies in Ophthalmology” aims to become a reference centre also by issuing Certificates of Competency in the field of corneal refractive laser therapy, given the involvement of the main European opinion leaders and laser specialists in the project training activities and also through the planned partnership with the most important professional societies from Europe. The crossborder dissemination of the new medical services will be ensured also by Conferences and Workshops on both parts of the border, involving specialists and also patients and media representatives.

Developing a network of specialists in corneal pathology, retinal pathology and diabetic eye disease is a strong objective of this project. The continuous medical education for the selected doctors involved will be accomplished by scientific courses, wetlabs, drylabs, workshops, videoconferences, live surgeries and also by developing a webportal and medical guides for best practices in the field of corneal pathology, retinal pathology and diabetic eye disease. The webportal, as an infrastructure support, can serve as an educational device both for patients and doctors; telemedicine applications could be succesfully implemented to increase the diagnosis accuracy and to assure the accuracy of the surgical procedures.

The center’s activity will allow its specialists to elaborate informative materials for patients anddoctors, to identify the real trends of incidence and prevalence for the reference diseases and also to promote policy proposals in the field of corneal pathology, retinal pathology and diabetic eye disease.