

## SPINAL CORD INJURIES IN THE SENIOR POPULATION

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Although the life expectancy of patients with spinal cord injury (SCI) constantly and steadily increases, reflecting on the first hand the increase in life expectancy of the whole population, and on the other hand prolongation of active life, considering the age in which activities can be performed in full extent. The limit of so called "third age" in which these activities should gradually be extinguished is changed quidially, and thus extended by years. The period of inactivity is shortened to the last months or year of individual's life. In twenty years time 70% of European population shall be older than 60, and great deal of them will be professionally as well as recreationally active. This people shall be involved in n activities which could and in some instances will lead to the axial skeleton injury.

Considering the age of patients with a handicap caused by SCI, we must distinguish between two different groups. First group sustained their injury during their youth and aged together with their handicap, gradually accustoming themselves to the situation of being old. Second group of patients sustained their injury in older age and found itself in handicapped position simultaneously with expected diminution of whole life activity and in position of diminished reparative abilities. The grade of age induced changes is individually determined, and depends of genetics, of way of life, general health status, and not at least of cultural superstructure which determines social attitude towards the injury and its consequences.

Spine injuries are caused by mechanical forces, and exposure to them is directionally proportional to daily occupation, to cooperation in general social activities considering work, traffic, recreation or in the worst case exposure to the violence. Although the exposure to the neurotrauma remains at the same level in young population, since the circumstances as well remained the same, frequency of injury in older age, putting the border at age of 60 years increases by two reasons:

1. This population is more active;
2. Its share in general population has risen.

Progress in treatment of acute injuries of the spinal cord achieved during the last half century led to significant decrease of mortality of patients of any particular age. All references show that early stabilisation of the injured spine, followed by early, specialist rehabilitation with qualified nursing care to avoid the complications leads to significant improvement of final results of treatment. Revolutionary turn over of perception of injury in which the first line of treatment became prevention of complication and improvement of residual function instead of straining over the regeneration of destroyed neural tissue led to the situation in which majority of patients can expect attainment of live expectancy similar to uninjured population,

Until recently expected increased mortality of SCI in older age, in recent reports showed to be unexpectedly similar to the incidence in younger age. Improved emergent and urgent help lead to equalization of chances for survival without a direct implement of the patients age. Mortality rate at the spot of injury, before the arrival to the place where a qualified help could be given is slightly greater for older age, and this difference remains such for the first 72 hours post injury. What "makes the rub" is the incidence of complications in older age, and in almost all cases this means the aggravation of pre-existent chronic disease. Old population is endangered by early development of infections, with possibility of worsening of psychogenic problems, aggravation of cardiovascular diseases, development of uro-obstructive conditions and diminished possibilities for early activation. Frequency of these complications is doubled in older group of patients. There is a slight gender decided difference in co morbidity and complications are slightly less frequent in females. Dominant preexistent diseases are COPD, diabetes, coronary disease, hypertension, uro-obstructive conditions and changes in psychological structure developed by the change of individual social position in old age.

In the period between 1980 and 2000 the number of SCI in population over 60 years of age was increased five times, but the share of complete, transversal lesions in old age remained smaller than in young population. The reason lays in the fact that the main cause of injury in young people was traffic trauma, with great moments of force, while in old population main cause were falls in the same plane or form a small elevation with considerably less absorbed energy.

If we consider only the group with complete SCI, and extend the observation period to 5 days, the mortality in the group over 60 years of age is 27.5% in contrast to 3% in younger group of patients. In groups uniformed by initial deficit, the older people will have more residual handicap, because they have less possibility of functional adaptation, less possibility of compensation by the residual musculoskeletal capabilities and less psychological motivation for functional adaptation. The perception of old age is different in handicapped and non-

handicapped population. While in non-handicapped population an old age starts over 70 years of age, in handicapped population this border is usually 60 years, but in some reports it was lowered to 55.

After 60 years of age muscular strength diminishes to 70-75% of this in the middle age, but with greater decrease in sedentary oriented persons. At the same time, possible expression of muscular performances is additionally diminished by degenerative joint changes and bone hypo mineralisation. All these changes are geometrically increased after SCI.

Central nervous system is in steady state of discrete atrophy after very early age, and slow pace in neuron count can be registered as early as 25 years of age. The normal consequence of this is diminished possibility of information processing and decrease of number of efferent signals to executive organs. In the case of SCI the shortage of afferent impulses additionally accelerates the diminution of processing and leads to fast decrease in number of active processing units. Probably the most important changes are the changes of endocrine system that conduct to reduction of possibility of tissue regeneration. Lower levels of growth hormones and testosterone lead to rapid loss of body mass, and the same effect has lowered levels and diminished efficiency of insulin. The efficiency of immune system in cellular and humoral part is as well diminished. The skin loses its quality of body cover, as in epithelial as well in mesenchymal part, with consequent loss of elasticity and increased vulnerability. Kidneys lose functional units with consequent loss of functional capability, leaving the person just on the edge of renal failure. Impediment in micturition of men, and stress incontinence in women are common changes in older age, although could not be considered to be a normal phenomena of ageing of individual organism.

Fortunately, all organ systems have great compensation capabilities, and for a majority of people a process of ageing will be deduced to a sense of change and certain discomfort in physical sphere, up until the last months of their lives. Portion of people in the age 75 to 85 years who need a constant nursing care in uninjured population is 11-23% depending on general population group, and rises to 55-60% in the age over 85 years.

All of these reparatory and compensatory affects take place in injured population as well, but they are carried to their uttermost limits. Most of SCI patients will develop some kind of overuse syndromes, not only considering musculoskeletal system, and most of those who sustained injury in early age will develop some kind of spinal deformity.

Incidence of hypertension in SCI injured patients is two times as great as in their counterparts of the same age. Direct cause is not known, but additional factor is diminished venous return with an effect of accumulation of blood in extremities with multiplied increase in the risk of deep vein thrombosis. In old population led to the position of barely compensated state by diminished function of every single organ system such a change can lead to catastrophic disturbance in scarcely kept balance.

Complete reduction in activities and forced sedentary way of life lead to gastro-intestinal complications, with constipation being a major factor diminishing the life quality of daily living. Constipation of SCI person, added to chronic senile constipation obligatory leads to need of constant help. The appearance of haemorrhoidal nodes is a very unpleasant complication which in combination with chronic constipation can present a very dangerous consequence of SCI.

Respiratory complications are consequence of injury itself, but also a final disclosure of impairments sustained prior to the injury, form COPD to different degrees of respiratory surface caused by external factors such as smoking, professional damage etc.

Every SCI patient passes through the three different phases of confrontation with residual handicap:

1. Phase of repair, which set in immediately after the injury. In this phase patient draws out the best possible improvement form residual functional capacity;
2. Phase of maintenance, which is of different length of time and in which is patient is kept in a relatively stabile functionality;
3. Phase of deterioration, which is a reflection of degenerative development caused by overstraining of residual functional capacity.

Old patient suffers in all three phases. The patient has diminished residual functional capacity, lesser possibility of sustaining function by temporary overloading and finally a fast deterioration is developed because of depletion of functional resources of whole body system. A patient which sustained his SCI as an adolescent can be kept in phase of maintenance for over 20 years, but patient which was over 55 years at the time of injury can expect only 5-7 years of relatively stabile function before a phase of deterioration takes a place. Every ten years of life with SCI increases possibility for need of help of another person in normal daily activities by 40%. The commonest reasons are fatigue, pain and increase in body weight.

To grow old includes three independent events:

1. Physiological changes of whole organism;
2. Change of personal social role;
3. Change of personal self-esteem.

Taking into account that process of getting old leads to diminished efficiency of different organic systems, it is understandable that an old patient is more exposed to the consequences of injury, and to the consequence of development of complications of the same injury. At the same time, the change in social position of a person leads to the different relation of the whole community to the consequences of injury, and by that indirectly to different accessibility to complete capacities of treatment.

Altered relation to itself can give rise to resignation and to the quitting of exertion to sustain personal activity, and to the casements of cooperation treatment and rehabilitation. This difference sometimes is not conscious, but in some social circumstances it is even institutionalized. Escaping from the label of being old person usually means running away from the acknowledgment of the need of other person's help.

SCI patients in old age will need hospitalization four times more often than young patients, they will be dependent of respiratory help during the hospitalization 2 times more often, and even 22 times more often they will be dismissed into some of institutions for permanent nursing care.

Despite a very loud voices demanding a "right to growing old actively", this positive change of general view has little or no effect in old population with handicap. The expensive and chronically sub capacitated modern medicine, so common news in our time have catastrophic effect on the population that has no spare time to wait in queue.

Considering that we now know that we have a problem, that this problem will not be solved by itself, and that there are all chances it will grow, not old, but certainly bigger, we should have in mind that:

1. The vital interests of this population group have to be determined;
2. The common and particular interests should be investigated, and these with possible solution have to be marked;
3. According to the results the demands should be articulated and promoted;
4. Those demands must be fulfilled.

In conclusion, despite optimistic particularities considering the outcome of SCI in old population, the body of data from the literature shows that the mortality of SCI, when we take in account complete period of treatment, and when the complications are included into the account, still is many times greater than in the young population, This, whatsoever, does not mean that an old person with SCI should in advance be considered for a candidate for development of mortal complication. There are more and more frequent, though limited and non prospective reports of series of patients in which an equal treatment and qualified postoperative care and rehabilitation led to an initial complication incidence which was not so different to younger group, and that finding leads to opportunity that the mortality rate could be diminished as well. It is apparent that this group of patients should have early stabilisation of axial skeleton and early and determined rehabilitation programme, but that a development of late complications should be anticipated and prevented, having in mind all pre-existent diseases which have to be treated before they show themselves in full extent. Having this in mind in some very near future, an age of the patient should not have a greater impact on final result and mortality than the extent of SCI itself.