Cardiorespiratory responses to exercise in acute spinal cord individuals

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The health care needs of persons with spinal cord injury (SCI) continue long after discharge from a rehabilitation hospital. Meeting those needs amid a rapidly changing health care delivery system requires that policy makers and rehabilitation professionals develop a comprehensive understanding of the health care needs of SCI workers in which this population currently accesses medical services. Subjects comprised a community-based sample of 69 men with SCI who received recommendations based on a comprehensive medical screening performed as part of a study of the life status of people with SCI. This study describes their responses to the medical recommendations. Each subject was contacted 3 to 6 months after the recommendations were mailed. The recommendations for 72% of the respondents included instructions to consult their physician for follow up. Most respondents (74%) had a personal physician. The identified physicians were primarily family practitioners and internists in the community. Less than 22% of the group relied primarily on rehabilitation professionals for primary as well as injury-related health care. The compliance with the recommendations was 80%. Barriers to obtaining medical care were reported by 42% of the respondents. These included financial barriers, accessibility and transportation problems as well as issues of physician sensitivity and knowledge.

“Simultaneous Use of Psychological and Functional Outcome Data to Identify Distinct Subgroups of SCI Adults.” Evan R. Cohen, PhD (University of Michigan, Ann Arbor, MI); Denise Tate, PhD

This study identified two clinically distinct, modal groups of adults recovering from spinal cord injury (SCI) by examining the simultaneous distributions of both functional and psychological rehabilitation outcomes at an average of four years post discharge. Subjects included 145 SCI adults (mean age 34.6 years) being followed up by a major Model SCI Systems hospital. At admission, 65% were single. 73% had graduated high school, and neurological impairment levels were evenly distributed. Follow-up measures included the Depression Scale (DEP) of the Brief Symptom Inventory, the CHART, and the Benefits Coverage Inventory (BCI). A three-dimensional frequency distribution of CHART by DEP scores disclosed two modal groups, separated by the DEP median and differing significantly on the CHART. Groups did not differ on neurological impairment, but the “positive” group was significantly older, more often married, more often insured privately, and more often Medicaid insured than the “negative” outcome group. These data identified reliable differences in recovery experiences of SCI adults that cannot be explained by neurological impairment but rather related to clear-cut differences in individual social context, ie, availability of interpersonal and financial support. Implications are discussed in terms of rehabilitation discharge planning and ongoing support of independent living.

“Cardiorespiratory Responses to Exercise in Acute Spinal Cord Individuals.” Sandee L. Melton, MIA (Shepherd Spinal Center, Atlanta, GA); South A. Morrison, BS

Able-bodied individuals who participate in a routine exercise program show improved fitness levels which can decrease their risk for heart disease. Cardiorespiratory disease is a leading cause of death in the spinal cord injured (SCI) population. A limited number of studies have been performed evaluating the cardiorespiratory responses of exercise for the acute SCI population. The purpose of this study is to evaluate cardiorespiratory response of SCI individuals to an exercise program. Subjects were 25 acute hospitalized SCI individuals with the diagnosis of T10 to T12 paraplegia. All subjects performed a discontinuous, progressive arm ergometer test upon admission and discharge. Nine subjects also participated in a 6-week exercise program on an arm ergometer at 60% of their maximum heart rate for 30 minutes. A 2-tailed t-test was performed comparing the exercise group with the non-exercise group for resting heart rate, peak VO2, and heart rate and VO2 measures at equivalent workloads. Results showed there was no significant difference between the two groups in all of the variables. Subjects in both groups did show a positive direction towards improved fitness from the initial test as seen by decreased resting heart rates, increased peak VO2, decreased heart rate at equivalent workloads and increased VO2 at equivalent workloads. The results indicate that the rehabilitation process itself has an impact on improving fitness levels. Any changes in fitness levels occurring from the exercise program may be over shadowed by the change occurring because of their rehabilitation. An intensive rehabilitation program for the acute SCI individuals is important to teach them functional skills, but also to improve their level of fitness. Further studies need to be done to evaluate the effect of exercise on the SCI population.

“Formal Education After Spinal Cord Injury: Necessity Is the Mother of Accomplishment?” Marcel P. Dijkers, PhD (Rehabilitation Institute of Michigan, Detroit, MI); Michelle Buda Abela, MA

Because spinal cord injury (SCI) often occurs at a young age, many persons return to complete their education after injury. Others who had finished school may return in order to qualify for a job that better fits their reduced physical abilities. The literature offers little information on educational accomplishments after SCI. This paper aims to describe, for a large sample, educational changes over many years after injury. The National Spinal Cord Injury Data Bank includes information on more than 14,000 cases, followed prospectively each year following injury. At the first anniversary of injury, 19.8% described their primary status as “student” (versus 9% before injury). This percentage, after an initial increase, decreased to less than 10 percent by the 15th anniversary. At their latest follow-up, 15.1% had improved their education level from before injury. Race/ethnic group, neurological category and age at injury (but not gender) were factors in educational accomplishments. By the tenth anniversary of injury, the cases included had a better educational level than the U.S. population as a whole. This suggests that SCI may be an encouragement of, rather than a hindrance to, the pursuit of education. Patterns of change over time and their determinants are described.

“Occupationally Related Spinal Cord Injury.” Renee L. Johnson, BS RPT (Spinal Cord Injury Early Notification System, Colorado Department of Health, Denver, CO); Kenneth A. Gerhart, MS; Richard H. Hoffman, MD; Gale G. Whittenek, PhD

Thirteen percent (81 cases) of all the spinal cord injury (SCI) cases that were reported to Colorado’s population-based SCI surveillance program between January 1, 1986, and December 31, 1991. occurred on the job. Another 339 non-occupational SCIs were also reported during that time period. A comparison of these occupational and non-occupational SCIs revealed significant differences in etiology, occupations and times that injuries occurred. A greater percentage of motor vehicle crashes (MVCs) occurred off the job, while a greater percent of SCIs caused by falls and falling objects occurred on the job. Injuries among structural workers accounted for a greater percentage of occupational injuries (41%) than non-occupational injuries (6%). Those involved in farming occupations likewise had a greater percentage of occupational injuries (10%) than non-occupational SCIs (2%). More occupational than non-occupational SCIs occurred on Wednesday day and fewer occurred on Sunday. A greater percentage of the occupational (40%) than non-occupational (40%) injuries occurred during the four summer months (May, June, July, August). This analysis suggests that there are specific identifiable occupations, etiologies and times of injury associated with occupational SCI that are readily targeted for prevention purposes.

“Perioperative and Postoperative Complications in Spinal Cord Injured Patients Receiving General Versus Spinal Anesthesia.” Flora McConnell, MD (Bayor College of Medicine, Houston, TX); Rabih Darouiche, MD; Jon Markowski, MD

Spinal cord injured patients are prone to require multiple surgical procedures during their lifetime. However, the unique physiology created by spinal cord injury changes the risk profile of each anesthetic technique. There is currently no consensus regarding the effectiveness of spinal and general anesthesia in preventing complications in this patient population. In this ongoing study, 20 patients with spinal cord injury above the seventh thoracic level have been randomly assigned to receive general or spinal anesthesia, and followed for the development of perioperative and postoperative complications. Complications occurred in 40% of the patients receiving general anesthesia with 20% autonomic dysreflexia, 10% hypotension, and 10% pneumonia. The preliminary data suggest there is less risk of significant complications with spinal anesthesia compared to general anesthesia. Continuing this study to increase the sample population is needed to confirm these findings. Implications of this study and issues pertaining to spinal cord injured patient will be discussed. This information is valuable to health care providers from all specialties who work with spinal cord injured patients.