

AVASCULAR BONE NECROSIS SURVEY (SYDNEY)

Dr Ian Unsworth

A Skeletal Survey for AVBN is being organised at the Prince Henry Hospital at Little Bay, Sydney for sports and professional divers. With this pathological condition it is important to maintain a consistent level of radiographic interpretation and for the same criteria of x-ray change to be used to chart the presence, regression or advancement of the condition.

Straight A-P x-rays of joints (shoulders, hips and knees) and long bones are used for occasional divers. Tomography is used for professional and active sports divers, as also for proven lesions.

It is suggested that examination be on an annual basis for professional divers and active sports divers, two yearly for occasional sports divers.

Examinations are performed at the Prince Henry Hospital, Little Bay, Sydney, NSW 2036. Further information can be obtained from Prof. Bryan Williams, Department of Radiology or Dr Ian Unsworth, Hyperbaric Unit, Prince Henry Hospital.

This survey is intended to plot the presence and progress of the disease and to obtain information concerning the incidence of the disease in the different categories of diver and hyperbaric chamber personnel. It will also cover Workers Compensation Cases. To get the fullest information from such a survey assistance is requested in the provision of as many divers as possible. Preliminary studies of the first 50 sports divers has revealed some unexpected findings and it is hoped as many cases as possible be reviewed.

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A PLEA FOR A CENTRAL REGISTRY OF HYPERBARIC WORKERS

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Occupational health needs are often poorly described and less understood. Commercial tunnel work and professional diving have been the sources of considerable misinformation on the health and safety hazards of both occupations. One outstanding health risk emerging from years of professional experience is the problem of osteogenic necrosis (often called aseptic bone necrosis). The relationship of this health hazard to other hyperbaric problems is not known, although very little data exist. While cause is unknown, many seem possible. No treatment is known except for avoidance of exposure and mechanical joint replacement. Such a health risk within an occupation requires major efforts for solution. While the industry of caisson work has been almost completely unionized and considered by the agencies of Workman's Compensation, the diving industry, in many instances, has not been.

The diving industry has operated for many years from the uncertain base of physical courage and a desire to eat. The risks have been frequently recognized, but little has been planned deliberately to avoid the risks until recently. Some diving risks have been admitted only in recent years. Attempted accident analyses do suggest that people remain the basis of most man-machine problems. Only recently has the diving

industry, under the pressure of advanced techniques, begun its own training programs. Not all risks are subject to the techniques of safety system analysis. Some medical problems, while tentatively accepted, continue to defy analysis because of the lack of data and concepts applicable. Such a problem is osteogenic necrosis, a problem known for many years. The probable multiple etiologic mechanisms should be subject to factorial analysis.

Osteogenic necrosis occurs in two general forms. One destroys the articular surfaces of certain joints preferentially, while the other occurs in the shafts of long bones, usually without human incapacitation. For many years, osteogenic necrosis has been frequently observed among caisson or tunnel workers and has been denied by and among professional divers. However, in retrospect, individual examples have been known for years. Advanced diving techniques, such as saturation diving, have renewed interest in the problem within the diving industry. Radiographic surveys were initiated by employers and by Federal agencies concerned with the health of their own employees; many symptom-free examples have been found, usually with shaft lesions. The problem has high significance to workmen's compensation programs, to the insurance agencies and to the employees themselves, since the risk is present while a direct relationship to experience is not. The lack of etiologic information makes prevention difficult to program. No information exists on treatment that reverses lesions. The need for data collection is acute, and perhaps critical in any reasonable time frame. The national requirements for increased facilities in water distribution, sewage collection, transportation and petroleum production will increase the employment of hyperbaric environmental workers, each of whom is potentially vulnerable to osteogenic necrosis.

Data collection therefore has become a national health need. Data collection on the problem of osteogenic necrosis among caisson workers and professional divers will provide centralized collection of diving experience, radiographic studies, life habits and health characteristics of a large number of exposed persons over many years. The collected data should then be subjected to evaluation and analysis and the results reported epidemiologically. Survey questionnaires must be designed for field coding to provide needed data to be selectively supplemented by interview techniques and by investigations. Persons skilled in long-range health studies of this scope should be retained by contract when their established competency, including both electronic data processing skills and availability of the necessary resources, has been established. Prior experience in this specific area of osteogenic necrosis, diving or caisson work, is not needed as expert advice is readily available by consultation. The critical need is in the data collection, bio-medical analysis and evaluation of health survey problems.

The data collection must be involuntarily; the provision of data must be a requirement of employment, and the responsibility must lie with the employer. Whenever an abnormality is discovered from radiologic or medical examination, this information should be reported to the employee. He stands in the privileged position of requesting less hazardous employment, which it should be the requirement of the employer to provide, if at all possible, or of accepting the risk himself. The development of osteogenic necrosis among persons employed in hyperbaric occupations is a known risk. It should not be considered evidence of negligence by the employer, as neither the causes nor the preventions are known. Therefore, pension rights should be assigned as they are under the Mine Safety and Health regulations, and should not be the subject of litigations. With required data, employee privilege and assigned pensions not subject to litigations and many current problems within the diving and caisson

occupations may be avoided. The employee is given the privilege of protecting himself, the employer is given the protection from unwarranted lawsuits, and the pension disability costs will be reduced. The health of the entire community will be enhanced, its safety improved and its survival assured. A National Registry must be established.

A national effort of this scope will provide epidemiologic data that will be extremely valuable. Since we are not certain of the causes of bone necrosis, nor the relationship of various suspect factors, systematic data collection empirically selected offers the only opportunity for immediate profitable study. The establishment of a national registry under contract and funded by the National Institute of Occupational Safety and Health will provide the opportunity and the mechanism to evaluate and analyze data collected nationally under the authority of the Occupational Safety and Health Act of 1970; that law (public Law 91-596) describes the responsibility to conduct research in areas identified as occupationally important for safety and health. The national registry would provide data of collateral significance not now available, including the qualifications and numbers of persons employed and the amount of work done within these industries. Other health and safety problems might also be identified that are not now recognized because of the wide dispersion of isolated data. The national registry for aseptic bone necrosis will provide, for the first time, data needed to describe the industries of caisson construction and professional diving, and some of their medical risks.

In the United States, under the authority of the Occupational Safety and Health Act of 1970 (Pl. 91-596) we have for the first time, the opportunity to document the employment and injury experience by occupation and the relation to exposure risks, and the health pattern of those employed in professional deep sea diving and caisson work. It is possible, using regulations published by the Department of Labor, on the advice of the National Institute of Occupational Safety and Health, to require that all hyperbaric exposures of all individuals employed be recorded and filed centrally, and to require certain health standards and certain health examination techniques to be routinely applied to all individuals who are admitted to the acceptable risk pool.

In the United States, we are not able to define the extent of the problem as we have no index or central registry of individuals who work in a hyperbaric environment.

There is a tremendous advantage in having central registry of health data, including the data obtained from serial pre-employment examinations, and examinations of individuals who plan to be employed in hyperbaric environments. Such data, if procurable under the authority of the Occupational Safety and Health Act of 1970, would permit the definition of the problem of osteonecrosis related to hyperbaric exposure, and would provide the opportunity to explore and investigate other potential hazards of repetitive exposure to hyperbaric environments.

A very rough current estimate suggests that there may be 5,000 people who are habitually employed in either commercial diving or caisson work. The total number may be larger, but the experience obtained at large construction projects suggests that there are many peripatetic workers who work for very short periods, increasing the probable total figure. The steady workers who essentially complete the task are a fairly small group. The men employed in this work often wander from one job to another, or one employer to another, while a small group is employed by a single contractor. Therefore, their work records, exposure records, and health records are now essentially unobtainable. Their injuries represent a major known risk, which is now not preventable under the acceptable standards of employment. It will be only

by the compulsory accumulation of data that more acceptable standards of employment can be achieved on the basis of improving the health and safety aspects of employment. Individual decompression injuries will always occur.

A national data collection activity aimed at specifically improving the safety and health of employees within the professions concerned can only be achieved by the use of the Occupational Safety and Health Act of 1970, and by the co-operation of the Occupational Safety and Health Administration of the Department of Labor. If the Department of Labor is willing to require of all employees the collection and filing of continuous data according to regulations posted by the Department of Labor, we will be able to learn, at an experience level, those factors which are pertinent to the current injury rates among the employees within the hyperbaric professions.

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A POLICY WE WILL FOLLOW:

The critics who claim that science sees the world as banally clear-cut and everyday will have to realise that more and more scientists are coming to feel like JBS Haldane, who once said: "The world is much queerer than we realise", though perhaps not all would go along with the way he finished that remark, "in fact, I think it is queerer than we can realise".

Dr David Davies, the Editor of the British Science Journal "Nature" told delegates to the ANZAAS Congress (21 January 1975) that more scientists should be prepared to "fly a kite" in full expectation of them being shot at.

He said: "Literally half a million journals throughout the world report dull experiments people have made. There are very few journals where people can really chance their arm. We have to go for the ideas when they first surface, where they may be disproved".

Dr Davies said an example of adventurous scientific research was the work into the claims of psychic power by the Israeli spoon bender, Uri Geller. Many scientists looked down their noses at such research and maintained that there was no point in publishing it. The decision to publish, said Dr Davies, was taken because in his opinion it was in the interests of science to get it out and get it known. He believed that science developed by outrageous ideas. "One works up to new levels of understanding by something that seems absurd at the time. The image of scientists often projected is of men who know it all, who never get caught and who never have to say "I don't know".

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REPORT ON CARDIO-PULMONARY RESUSCITATION SEMINAR  
2 NOVEMBER 1974

Dr Don Harrison,  
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The Faculty of Anaesthetists of the Royal Australasian College of Surgeons conducted a one day Seminar on Cardio-Pulmonary Resuscitation with medical and non-medical representatives of the major resuscitation bodies, medical societies and government