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Post-Polio Clinics Directors Network
January 17, 2006

Disclaimer: The following are unofficial notes which have not been read by or approved by the speaker.

Points of Discussion:

- Update on recent epidemiological studies from the Center on Health Statistics
- Information presented by Dr. Nancy Myers at the Conference in June on Epidemiological Studies from the Center on Health Statistics, is significant and bears repeating. Analysis not yet finished so it has not been published.
- Dr. Myers did not set out to do the study – did not know anything about polio.
- In 1994 and 1995, National Health Interview Survey (NHIS) surveyed a random group of households in the U.S. trying to reach all segments of society and all geographic areas to determine the health of the country. Every year or so they ask specific questions about targeted issues such as polio. These are trained interviewers who do household surveys year round.
- Website for NHIS Polio dataset:
- ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Datasets/NHIS/1994-95 POLIO
- First question asked was: Have you ever been diagnosed with polio?
- Do not believe they broke down paralytic from non-paralytic.
- Total number who responded "yes" was almost 920,000.
- Today, given the fact it is 10 years later, there may be 850,000-900,000.
- Mean average then was 56 years; now it would be 66 years.
- Percent diagnosed as having polio by health care professionals was 11%, a little over 100,000 people.
- Another question was: Do you believe you have PPS (not diagnosed by a health care professional)?
- The number was 25%, 230,000 or one quarter million.
- The 11% was included in the 25%.
- Do not know how many were false positive or false negative.

- So much in the literature about polio survivors being Type A -- the survey found no correlation between the people who contracted polio and Type A personality.When looking at the number of years of education, the number of years increased with the diagnosis of PPS. For example, college graduates were 57% more likely to report the diagnosis than high school graduates.
- The older a person is at onset, the more likely they are to report they had PPS.
- Survey asked about hospitalization. Those hospitalized were more likely, 2.96 times, to report being diagnosed with PPS than those who were not hospitalized.
- A subanalysis asked about torso muscle involvement. People who have involvement were at a subclinical level or they just did not remember.
- No distribution of where people are in the country: where they contracted polio, grew up and lived and where they live now. (In Florida, billboards advertise support groups.)
- Social Security Administration in Baltimore, MD asked for guidance when they were writing the criteria for disability for polio - what it was, how to diagnose, what constituted enough disability to be eligible for social security benefits.
- Joan Headley will send the questionnaire to be included with the discussion points.
- Why certain drug trials show no benefit but the medications are effective for some

    1. Modafinil
    2. Pyridostigmine

- In both recent and older drug trials, none have actually shown that the medication that was tested was effective.
- Dr. Halstead has seen patients who have responded to the drugs Modafinil and Pyridostigmine.
  Modafinil - Dr. Halstead was part of a multi-site study that has just finished. Included were USUHS, NIH, WRAMC and NRH.
- The design of the study was a double-blind, randomized, subject-control. The patient was his/her own control and either received active ingredient for six weeks or inactive ingredient for six weeks; two weeks wash out and six weeks receiving the post-intervention - the active or inactive ingredient.
  Design was nice and a lot of criteria. Certain morbidities were excluded. A sleep study was part of the protocol. Question about polio diagnosis.
- Modafinil has been approved for narcolepsy, shift work fatigue and sleep apnea. It has been used for fatigue with MS.
- The side effects are very minimal. It is quite well tolerated and the Army is interested in this for soldiers who are in combat and cannot return to the base for a nap.
- Major efforts to attract people to the study and funded by the Department of Defense.
- It was an ambitious protocol and people had to make six visits.
- There was a very rigorous physical and neurological exam and a lot of people were excluded for various reasons.

- There was a lumbar puncture arm - if the subject wanted to get a fluid analysis now and use it for the future.
- Thirty-six folks met all the criteria and were in the study; three withdrew. Two subjects are still in the study. Twenty-eight have completed the treatment.
- For a number of reasons, the code is broken and initial analysis made on these subjects. As far as they can tell, there was no benefit.
- The primary outcome was FSS, which is a nine-question scale, and each question is scored from 1 to 7. To enter the study you need an FSS score of 34 or greater.
- They mix mental, physical and emotional fatigue.
- Other outcome scales are VAS 1-10 and FAS - 40 questions.
- The patients had to keep logs, scoring their fatigue on a regular basis.
- In the analysis of 28 subjects, they did not find any significant difference between the FSS scores and the other scores whether the subject was on the placebo or active ingredient.
- After each person completed their 14 weeks, they were asked if they could tell which drug they received first and second.
- Most people who responded were correct. It was interesting to know they were able to tell they were on Modafinil and at which time.
- People who were in the study went to their primary care physician and asked for Modafinil.
- Study was done in the Washington, D.C. area with four hospitals. The analysis did not show any benefit but the subjects seemed to know they were on Modafinil.
- Another study just published this month in the January 2006 issue of Muscle and Nerves looked at Modafinil and their protocol was essentially identical to the one above.
- They had 14 patients and found no significant benefit of the medication as compared to the placebo.
  They used different outcomes; did slightly different tests.
- Bottom line - there is no benefit.

Studies on Pyridostigmine - beginning with Trojan's study in 1999.

- Multi-center study, 128 individuals.
- They found no significant difference between those who were on the placebo or active ingredient in terms of improving fatigue.
- As an outcome, SF-36 health survey.
- Another study published in 2003 in the Journal of Neurosurgery and Psychology.
- Similar protocol as the 1999 study.

- Thirty-one treated with Pyridostigmine and 31 controls and the results showed no decrease in fatigue and some increase in walking distance.

Dr. Halstead believes the ideal for this study would be to use this medication as it was with Modafinil for the patient as his/her own control.

Comment: Based on discussion that was held on fatigue and different kinds of fatigue, in post-polio there are different causes for the fatigue and limited energy. There may not be one perfect answer. Improvements can be made by different modalities.

Status of IVIG in treating persons with PPS

- This revolves around measurement of cytokines.
- Released in a variety of conditions in which there is some level of injury, inflammation and stress and they release cytokines and it becomes chronic.
- Going back to 2002, one of the earliest reports, showed inflammatory cytokines in PPS patients was the same level as individuals diagnosed with MS.
- About the same time there was research in Norway about a woman diagnosed with MS and treated for five days. In the data for three months follow-up there, was an increase in strength and a decrease in fatigue.
- The same researcher did a placebo controlled, double-blind study with 20 PPS subjects. Ten got the placebo and 10 immunoglobulin.
- The outcome measures were stress, FSS, disability rating and general health.
- The report was an abstract which appeared in the proceedings of a European neurology meeting and had been published in July 2004.
- Work going on in Stockholm with elevated cytokines. They looked at PPS (26) and other neurological (26) disorders.
- IVIGs were given over three consecutive days.
- Comparing those subjects with the 26 patients with other neurologic disorders, they did not have elevated cytokines to begin with.
- Patients tolerated the medication well.
- Sixteen responded and a follow-up study was done and cited by Borg in St. Louis.
- They were given immuoglobulin and the outcome measures were SF-36 which indicated an increase in muscle strength and an increase of vitality.
- Another study out of Stockholm discussed by Borg in St. Louis, was a multi-site, double blind, placebo-control with 135 subjects.
- IVIG was given for three consecutive days, possibly in the same range as reported by other investigators.
- What they found was a significant increase in strength, increase in activity, decrease in pain and increase in quality of life.
- In increased quality of life, the sub-scales are general health and vitality.

- Dr. Borg said about one-third of the folks who got the immunoglobulin reported "good to excellent"; one-third "good to fair"; one third were "not good".
- Problem with implementation in this country is the cost. Inquiries of companies that make immunoglobulin indicate it would cost $25,000-35,000 and it is not clear whether insurance would pay for it.

Comment: What attempt might there be to organize a cooperative trial where several centers would use a common protocol? It would have statistical power.

In the Modafinal study, with four hospitals contributing, 400 people were interested but because of the criteria, tests, etc, people fell away. They were happy to get 36 people to go through the entire study.

Need someone to take leadership on that - someone to write protocols and get permission from the IRBs at each location.