John P. Murtha
Neuroscience and Pain Institute
Affiliate Conemaugh Health System

1450 Scalp Avenue, Suite 120
Johnstown, PA 15904

Post-Polio Clinics Directors Network
June 17, 2008

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

- What is known and relevant for this talk is that Post-Polio Syndrome is a secondary effect of the original paralytic disease.
- After a period of stability, those affected have new weakness and fatigue.
- PPS is very difficult to diagnose; it's a very lengthy process; diagnosis by exclusion.
- This study looked at the immunological response to the polio vaccine in vaccinated adults.
- Case-matched clinical study of three groups – healthy, stable polio survivors and PPS donors.
- None of the individuals were "boosted" (given the vaccine) prior to the study.
- Few researchers have looked at the T cell responses.

Antibody Study

- Idealized version of data results expected (when looking at antibody titres):
    - The healthy would be low, the PPS individual would give a high response. In that case it would be easy to say "yes" these particular immune markers are useful when seeing a patient with polio.
    - In a healthy vaccinated individual vs. an SP, the response would be overlapping and no clear difference would be seen between the healthy and SP individuals.
    - The response would not be different for the SP and PPS individuals.
- Able to establish that all individuals – healthy vaccinated, stable or suffering from PPS -- all have these properties. They can recognize and actually kill the polio virus.

T cell study

- Healthy individuals have different numbers of Regulatory T cells. The group as a whole has less than 10% of Regulatory cells.
- PPS individuals have a significantly higher number of Regulatory T cells.
- There is a big difference between the healthy and PPS.
- Average for SP vs. HV is not significantly different.
- This shows that the Regulatory T cells could potentially be used as a diagnosis marker.
- PPS T cells produce both inflammatory and immunosuppressive cytokines.
- In this study, the PP individuals actually confound the study because the SP have a widespread number.
- This is a small study. It was difficult to recruit SP individuals for the study.

Question: Does it make any sense that there could just be a decline in someone's immunological function? Another trigger? Is there an age when there is immunological decline?

Answer: It's very possible, at least in women whose PPS begins after menopause. It's possible there are triggers other than autoimmune but it doesn't explain everything. All PPS individuals have this functional deficit in their Regulatory T cells.

Question: On your etiology – you are not seeing that muscle wears out?

Answer: Would suggest that if there are cross-reactive T cells, it is possible the T cells are causing degeneration of the neurons just by attacking them. It is possible that there are polio virus specific T cells which attack them by mistake.

Question: Where do things go from here? When and what would the cost be in terms of picking a specific marker and doing a study on a larger number of individuals? Are some of the markers relatively inexpensive compared to others?

Answer: If the study would be a multi-center site and the IRB approved, it might not be a problem to have blood drawn elsewhere and shipped to University of Arkansas.

- Antibody studies are fairly inexpensive and easy for any technician to do. The cost of putting together a study where we are looking at 200 individuals - each of the three groups would probably be from $100,000-200,000 for a year.
- This small study cost at least $50,000.
- At least 100 individuals would be needed for a significant study.