General Discussion

Cognitive Function & Antioxidants

Dr. Joe Millward, University of Surrey: It is my understanding that work on antioxidants more or less dropped out of human studies, and the main focus for cognition is on B12 and DHA. And the B12 issue is becoming more and more prominent. Given the problems of digestive function in the case of the cats that were discussed this morning, then surely that would have a profound effect on B12 uptake. It's now known that there are very big differences in the bioavailability of B12 from different food sources with the possibility that it binds to collagen in meat and is very poorly available. The Norwegians have got a lot of data on milk consumption and B12 status. I think that Rosenberg has published data showing that B12 deficiency is much more common when appropriate indicators are used and that meat consumption in the elderly has very little impact on B12 status. So given the potential for hypomethylation in the brain and all of that, then I'm very surprised that it just hasn't been discussed.

Dr. David Williams, University of Illinois: I have been measuring cobalamin in cats for 15 or 20 years now, and I've been recommending replacement therapy. And many owners, even though the cat is no longer deficient because we've rectified the blood levels and the methylmalonic acids are back to normal, they will continue to give cobalamin injections. The feedback from the owners is that it really makes a difference in their animal's behavior. They act younger; they just generally do better. It is anecdotal, and I've only heard this from cat owners, so it may or may not be true. Also you mentioned that neuropsychiatric problems in older human beings with cobalamin deficiency are very well-recognized. So it probably is a component of some of the cognitive dysfunction. And one final point. I forgot that in our study we did measure body weight. We gave 20 cobalamin-deficient cats weekly injections of cobalamin, and over four weeks, those cats gained either half a kilogram or half a pound. Either way, it was really quite a striking increase in body weight.

Activity & Learning in Aging Animals

Dr. Gary Landsberg, North Toronto Animal Clinic: There seemed to be disconnects between a couple of lectures when Bill was giving his talk on the learning deficits that go on in the dogs in the laboratory and when Xavier talked about the clinical signs in pet dogs. They seemed to be two different topics. Brian brought up one study that Christina [deRivera] did with the sleep/wake cycle alterations in these dogs with the poor scores. Remember, they were the old dogs that Gary mentioned that did poorly on their learning scores and on their memory scores. Those old, aged dogs with learning deficits also had, in similar studies, alterations in exploring novel toys, alterations in interactions with people, with unfamiliar people. So, in the laboratory, there were some clinical changes in some of these dogs and the way they explored and interacted and in their activity levels. And you saw increased activity in these demented dogs, is that correct? Increased aimless activity, I should say.

Dr. Bill Milgram, CanCog: The activity changes that we reported were either of two. Either the animals were couch potatoes, or they showed sort of a random circling where they were really hyperactive, but they would not explore the objects. And it was sort of striking. We would put them in a room, and they would circle round and round and round the room. The reason that was interesting to us was that it completely paralleled what we see in patients with Alzheimer's disease, where some of them are wanderers. And if you ever watch them it's remarkable, they are constant moving. Typically they will pick things up, put them in their pockets and walk out the door, but they don't really know what they are doing. And there was sort of that parallel between what we saw in the dogs, in the two different kinds of cognitively impaired dogs. The problem with this work is that you're dealing with relatively small numbers, so that in order to get a really large sample, we needed to have a much larger population of aged impaired dogs so that we could see a good division.

Dr. Gary Landsberg, North Toronto Animal Clinic: And then you see these repetitive pacing, repetitive licking, repetitive activity, older dogs with dementia. You see the older dogs that are less interested in exploring novel toys, new environment. And so there were some clinical signs in the laboratory dogs is the point I am getting at. These were published and are in the literature in the laboratory animals and correlate to some of the clinical signs we're seeing in clinical cases, so just trying to show the link between these populations and studies.

Dr. Bill Milgram, CanCog: I'm not sure if this is going to turn out or not, but we have some very preliminary observations with cats. I know these will make some of you very happy. Simply looking at the behavior of old cats, it looks like it will be a lot more informative than for dogs if you put them in a room, look at them and observe what they do. And you're looking at your really old cats. They seem like they're going to be fascinating, but we still have a lot of analysis to do.