Unknown particles and structures in the blood of ALS-patients

By Dr. Erik O.H. Enby, MD

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Abstract

Two cases of typical ALS symptomatology – amyotrophic lateral sclerosis – are described. The diagnoses are made at the "Clinic of Neurology", at the Sahlgrenska University Hospital, Gothenburg. Unknown – earlier not described particles and structures occur in the blood of ALS-patients and they seem to vary in appearance and amount in phase with the look, character and intensity of the development of the symptoms.

The blood of the patients has been examined microscopically in ordinary lightfield with "Nomarski's interference contrast method". The documentation is made by video recording. Pictures have been digitalized from the video with clarifying diagrams added. The findings confirm Dr. Enby's previously established wound theory and it might contribute towards explaining an aspect of the genesis to the ALS symptomatology.

Case descriptions

Patient A is a 48 years old man, who in June 1991 started with numbness in his hands and stomach pain. Then a weakness in his arms developed, especially on the left side, and after that general weakness and lack of ability to walk but short distances. Patient A lost weight fast and went from 80 to 64 kilos. Initially he was examined at the medical clinic of the Linköping Hospital and later at the clinic of neurology of the Sahlgrenska University Hospital in Gothenburg. Patient A by then had developed muscle atrophy in general and showed small spasms in all the musculation except in the face muscles. All reflexes were increased and Babinski's sign existed on the left side. Gradually the condition was considered an amyotrophic syndrome with elements of both peripheral and central motoneuron damages on different levels. All laboratory examinations were essentially without remarks according to actual case reports from Lidköping and at the clinic of neurology in Gothenburg.

The patient came to my clinic in November 1992 in order to get some information about an alternative medical treatment that might stop the disease process.

The patient became increasingly paralysed and finally he passed away in February 1993.

Patient B showed a progressive muscle atrophy in arms and legs with muscle spasms as a very obvious symptom, though the symptom picture increased more slowly than with patient A. A severe disturbance of the speech indicated that there were damages even higher up in the spinal cord, in the medulla oblongata, which wasn't the case with patient A.

Blood microscopy

Microscopy was made with ordinary lightfield 100 times enlarged and with Nomarski's interference contrast method 1.200 times enlarged.

The microscopy equipment consisted of a Leitz' laboratory microscope equipped with a 100 W halogen lamp, modified UK condenser for darkfield, lightfield, phase-contrast and interference contrast, plan-fluotar objective and binocular photo tube FSA. Documentation has been made with Leitz' fully automatic microscope camera Vario-Orthomat. Video recording has been made with Panasonic CCTV camera, model WV-CD20/G.

A drop of blood was obtained from the finger-tip and immediately was made to flow out to a thin film between sterilized cover- and objective glasses. In order to make long observation time possible without the slides drying, the edges were covered with immersion oil. The blood outflow was first microscoped in full in an ordinary lightfield 100 times enlarged in order to obtain a first fast orientation and then a more special microscoping of interesting sections with interference contrast 1.200 times enlarged was made.

Results

Among the blood cells a diffuse spread of variously shaped immobile particles alien to blood was found and they seemed to bud off from each other and grow in size, but never to grow bigger than a red blood cell (*Figure 1* and *Illustration 1*). In addition a large amount of so-called disc-formed regions existed[1]. These were so big that they couldn't be photographically documented in full (*Figure 2* and *Illustration 2*). A sector of a region like that is shown in *Figure 2* and *Illustration 3*. The peripheral corona zone turned out to contain myriads of oscillating particles, a bit smaller than those spread among the red blood cells (*Illustration 3*).

Due to these findings a blood culture was made that was checked by the Department of Microbiology at Sahlgrenska University Hospital in Gothenburg. It didn't show any growth of bacteria and according to this examination there was no infection.

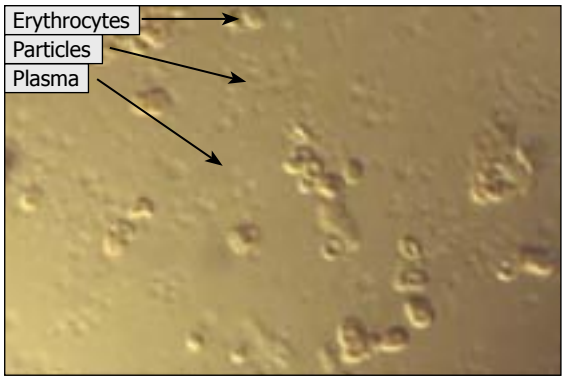

Figure 1. *Interference contrast 1.200 times enlarged. In the thin blood film between cover and objective glasses, in addition to completely normal blood cells a spread of particles strange to blood was visible in the plasma.*

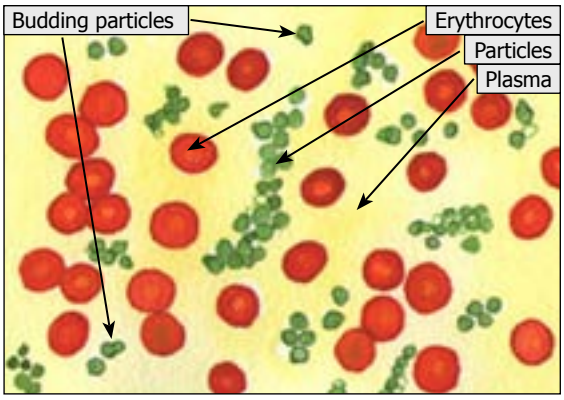

Illustration 1. *1.200 times enlarged. Particles spread among blood cells the way it can look in different places in the blood film.*

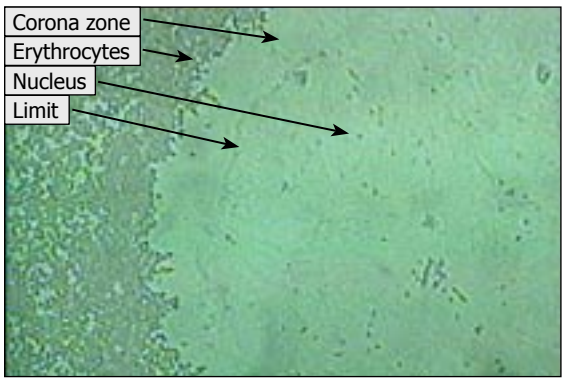

Figure 2. *Lightfield 100 times enlarged. Between cover and objective glasses a spread out of a spherical structure in the drop of blood. The disc-formed region that arose in the blood film was so big that it couldn't be documented photographically in its entirety. Here is a sector of the region, that shows the limit between the central nucleus part and the surrounding corona zone, that contains myriads of oscillating small particles. Parts of this sector, drawn in Illustration 3, 1.200 times enlarged.*

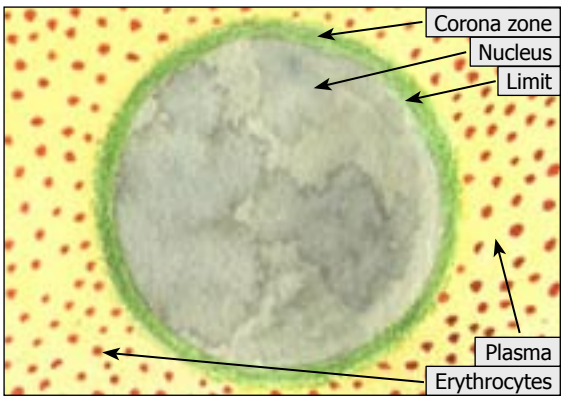

Illustration 2. *100 times enlarged. Disc-formed region as it appears in the blood film. Here the diameter is about 0,5 mm. In the blood from patient A, the diameter was often nearly 1 mm and not possible to document photographically in its entirety.*

With patient B the above picture also was found. Moreover, in the blood outflow there were up to 60 µm long and 4-6 µm thick worm-like structures, that showed movements of their own when moving around among the blood cells in a precise direction (*Figure 3*). On observation in the interference contrast they were clearly visible. At a changeover to ordinary lightfield microscopy they were almost impossible to see. The particle could notice the red blood cells that were in its way and avoided them by getting out of their way. In both ends it had a distinct ending, sometimes slightly spherically formed. In a demonstration at the Institute of Microbiology at the University of Gothenburg, one of the research assistants exclaimed: a snake! Professor Hans Wigzell ocularly judged the item as a filarie, that is a round worm. Moreover, compared with the red blood cells, there were also several other variously formed particles, though with a length that only exceeded the diameter of the red blood cells(7µm) with maximum the double length (*Figure 3*).

Discussion

The disc-formed regions[1] visible in the blood outflow between cover and objective glasses in the blood, should be equalled by spherical structures. The particles in the corona zone will form a thin layer in the periphery of these structures (*Illustration 4*) and limit their content against the surrounding and also spread out among the surrounding blood cells[1], where they seem to increase by budding and grow in size (*Figure 1* and *Illustrations 1, 3* and *4*). It's possible that the contents in these postulated spherical structures – in the blood not yet observed in their natural condition – are made of small, circulating pus drops – micro-abscesses. The particles in their periphery could form one of the developing stages of a vegetation in the soma and in these peripheries they form the front of the structures against the surrounding substance and together they may be supposed to form the growth zones of the structures – the growing centres of the micro-abscesses.

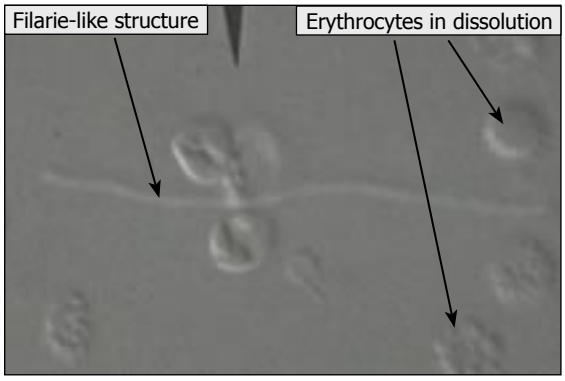

Figure 3. *Filarie-like structures. In the blood from patient B abundant microorganisms with filarie-like structures were visible, and they slowly moved in different directions in the thin blood film between cover and objective glasses. The length of these structures varied considerably and in the picture a form with a length nearly 60 µm is visible.*

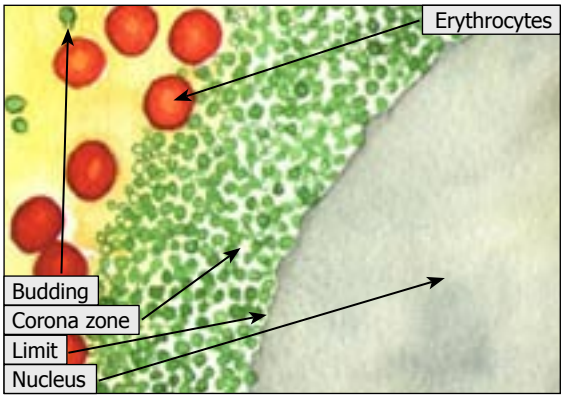

Illustration 3. Sector of a disc-formed region equivalent to the one in drawing 2 or part of the sector in picture 2, drawn 1.200 times enlarged. In the corona zone, myriads of oscillating small particles.

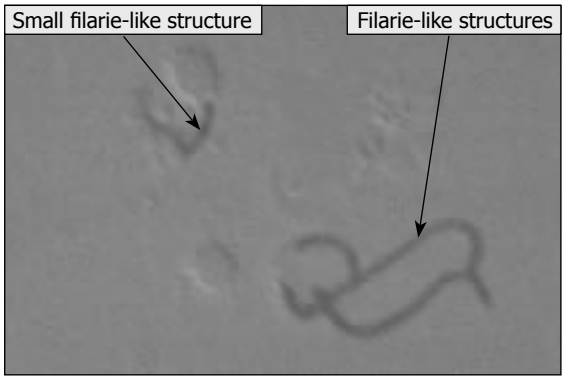

Figure 4. *The same microorganism - filaria as in picture 3. It has now moved to another place in the blood film and also changed its form and now shows four forks. A further metamorphosis couldn't be followed up.*

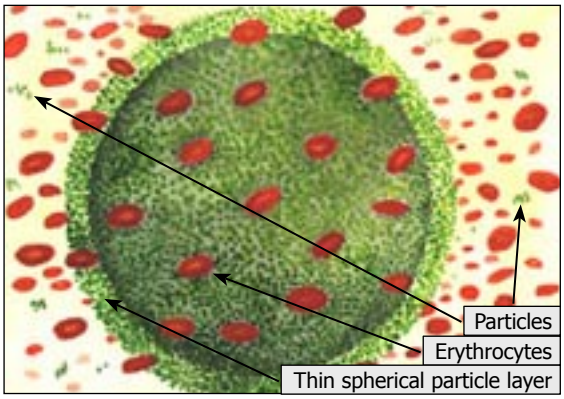

Illustration 4. *1.200 times enlarged. The disc-formed regions in the blood film between cover and objective glasses are supposed to exist in the blood as spherical structures, the contents (nucleus) of which are limited to surrounding blood cells by a spherical layer consisting of small particles. The density of blood cells on purpose has been made more open, in order to make it possible to show how the structure is flowing in the blood. Big blood cells are closer to, smaller ones farther away from the observer. The diameter of the sphere is about 0,1 mm.*

If this developing stage of the postulated growth in the soma, also can use some of the tissue areas in the central nervous system as substratum, it will also be infiltrated by particles and make room for stationary micro-abscesses with multiple tissue destruction as a result. By autopsy of patients with symptom pictures, that indicate a widespread disturbance in the motoneuron system, a widespread degeneration of equivalent tissue areas is found. A continuously new formation and development of small abscesses in these areas and later reabsorption of the abscess contents and replacement of equivalent tissue destruction with scar tissue might lead to this degeneration, that certainly will continue as long as suitable substratum is available.

For easily explained reasons we only know the final result of the background destruction process in tissue areas equivalent to the motoneuron symptom complex and other similar symptom complexes originating from different levels of the CNS. Other, in principle, similar destruction processes do exist in areas, that easily can be inspected, for example, in the skin, where for example a widespread acne in perpetual new formation and healing cause multiple small scar formations, that together may lead to a widespread degeneration of the skin tissue. One can assert that healing is taking place, but with defect-, function drop.

Micro-abscess formation with tissue destruction and healing with scar formation will be a type of destruction process, that will lead to degenerative changes and function loss, in any of the tissue areas of the soma, if they can form substratum for any growth process.

Conclusion

According to this theory, through microscoping the blood from our patients, we should be able to spot signs, that destruction in certain parts of the soma is probably about to happen.

The symptomatology indicates that this is going on in the motor path system in CNS on multiple levels.

A solution to a problem within medicine is almost always incomplete and therefore this theory is only meant to contribute a plausible explanation to how the motoneuron disease may come about.

The ALS-syndrome probably also occurs as a result of the tissue destruction due to other reasons, for example chronic heavy metal influence[2] or as a part of the symptom picture of conditions like Parkinson's or Creutzfeldt Jakobs Disease[3].

The abundantly occurring filarie-like findings with patient B indicate that also other forms of vegetation exist in the body fluids of patients with disturbance in the motoric path systems in CNS. Varying extent of growth-intensity and neurotrophy among these micro-floras might cause variation in progress and symptomatalogy of the patients. It can be important to study the particles and their relation to the cell wall deficient forms among the microorganisms, that hardly will be cultivated and their tendency to form abscesses and cause destruction in different parts of the soma. To stop this might mean that several chronic diseases, including the conditions that have been classified under the diagnosis motoneuron diseases, will be stopped in their progress, already just after the end of the period of incubation.

References

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(1969). *Brain's Clinical Neurology*. (3rd ed rev by R. Bannister). London. Oxford University Press.

Demonstrations carried out

Dr. Enby has shown video recording of structures and particles in the blood described in this paper. The following persons have seen the video:

Hans Wigzell, Professor of Immunology, Karolinska Institutet, Stockholm.
Mats Wahlgren, Professor at SMI and Karolinska Institutet, Stockholm.
Annica Dahlström, Professor of Histology, Gothenburg.
Marek SAS Lipecki, Expert of Oncology, Gothenburg.
Lennart Cedgård, Physician, Gothenburg.
P-A Öckerman, Professor of Biochemistry, Lund.
Olle Redhe, Dentist, Falun.