Evolution of Knowledge on the Etiological Diagnosis of Chagasic Infection

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Very early after the publication of Chagas, in 1909, methods for the parasitological diagnosis (xenodiagnosis, Brumpt 1914) and serological diagnosis (Guerreiro & Machado 1913) were already available. More interesting, both methods are still being used, 85 years later. The same method used until now for parasitological diagnosis of the acute phase, was performed by Chagas (wet blood smear, as well as animal inoculation). Of course, in the meantime, other techniques became available for etiological diagnosis. We may divide the improvements in diagnosis in several periods: on the first, until 1960, diagnosis was performed basically with the same tools, i.e. xenodiagnosis for the parasitological and complement fixation for the serological diagnosis of the chronic phase. The second period may be delimited between 1960 and 1975, in which major advances were performed. For the acute phase, a major advance was the Strout method for hemoflagellates (1962), and after, the microhematocrit, mainly for newborns and children. Camargo et al. (1974) described the IgM-IFI as a secure method for acute (including transfusionally acquired) phase. For the chronic phase, parasitological diagnosis include now hemoculture (Chiari et al. 1966), disputing sensitivity with xenodiagnosis, in a fight that runs until today. Serological diagnosis was firmly established, first with the standardization of the complement fixation reaction (CFR) by Almeida and Fife (1974) and also with the introduction of indirect hemagglutination (Cerisola et al. 1962) and indirect immunofluorescence (Camargo et al. 1966), techniques that are preferred today to the CFR. The third period, of, again, major improvements, was from 1975 until today. Parasitological diagnosis received a great help with the PCR amplification techniques (Sturm et al. 1989, Moser et al. 1989). Results obtained with hemocultures were improved after substantial modifications (Chiari et al. 1989, Luz et al. 1994). Serological diagnosis included ELISA after Voller description (1975), and several purified antigens started to be used, as GP90kD, GP72kDa, GP25kDa, and shortly after, recombinant antigens and synthetic peptides were used and evaluated in several multicentric trials (Moncayo & Luquetti 1990, Levin et al. 1991). Easier diagnosis encouraged scientists to monitor changes after treatment. Recognition that antibody levels could come down after successful etiological treatment during the acute phase, and even their absence after a period of time, led to search the same phenomena in recently acquired chronic phase children, with the same results, i.e. absence of antibodies against Trypanosoma cruzi after some years of follow up (Andrade et al. 1996, Sosa et al 1998). Today, the same holds for successfully treated chronic phase adults, but the follow up should extend to some decades [review in Rev Pat Trop 27 (Supl.) 1998]. This is a clear example of the usefulness of laboratory tests in Chagas disease, apart from diagnosis. In this period, other tools started to be used, as the chemiluminescent assay (Almeida et al. 1994) and the fluorescent activated cell sorter (Martins-Filho et al. 1995).

Nowadays, high technology applied on serological techniques allow to use few steps with shorter incubation time, which permit to run an ELISA test in less than 1 hr, instead of 8 hr when it was described. Other assays involve the use of recombinant antigens in strips, in a single step, with results in few minutes, as one developed by CYTED-BT (Bialy 1998). Nevertheless, performing two parallel assays is still necessary, since we lack of an universal antigen, recognized by all infected individuals. Responsibility for true results has been increasing, avoiding both false positives or false negatives. Even if parasites are scarce, the tendency to look for circulating antigens with different methods, including PCR, will give in the near future, more basis for a true diagnosis.
REFERENCES


