A New Visual Method Evaluating Multiple Data (Diagnostic Radar Chart) in General Toxicological Study

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In assessing the toxicity of a substance, it is preferable to test as many hematological and biochemical items as possible. However, a general assessment of the results for all items becomes more difficult as the number of test items increases. We had previously devised a Radar Control Chart (Takizawa et al, 1989) to simplify the general evaluation by the visual presentation of the quantitative data of many items. We recently tested the validity of this chart in general judgment about the toxicity of a test substance (Diagnostic Radar Chart). 3 animal models (hepatopathy by CCl₄, Nephropathy by gentamicin, Hemolytic anemia by phenylhydrazine hydrochloride) of 32 of hematological and biochemical items were measured. Personal computer (NEC PC-9801) and programs we made were used. Data procedures were as follows: (1) data conversion (standardization) to compare multiple data for the same category; (2) making a Diagnostic Radar Chart for comprehensive and visual analysis. Using this method, it came to easy, shortly and visually to compare to 3 animal models. The patterns of the Diagnostic Radar Charts were apparently different from each other, and the target organ of any drug may be estimated by the observation of the patterns.

TS-1 / SAS : AN INCORPORATED DATA PROCESSING ENVIRONMENT FOR TOXICOLOGY STUDIES:

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TS-1 (Toxicology + Statistics - System 1) was developed originally in our laboratories, both as a data management system and as SAS (Statistical Analysis System, SAS Institute Inc.) interfaces, to support toxicological data processing steps, i.e. collecting data, calculating data sets for SAS analyses, SAS processing, and making tables and graphs out of statistical parameters derived from the SAS processing. Thus, by being incorporated with SAS, TS-1 has been providing us with a reliable data processing environment on a microcomputer network. Since the system validation procedures were introduced into the GLP regulations, we came to think it a practical solution to use SAS, which had been used by the largest number of users in the world as a statistical software package, for the quality assurance of statistical data processing. So TS-1 was designed for linking SAS, as a back-end processor, in the routine data processing procedures, and was developed in "BASEII plus" considering the following essential features:

1. Double check (verification) loop system of input data.
2. Access control and flow control for the security and integrity purposes.
3. By managing input and output figures, expressions for the calculation, and statistical procedures of each item (e.g. relative rat's liver weight) as a master file, perform input and output regulations, calculations, and statistical manipulations automatically, and eliminate the program correction step for the alteration of these parameters (e.g. t-test multiple comparison).
4. Transfer data files and SAS program files automatically from/to TS-1 to/from SAS.
5. Produce summarized tabular and graphic outputs founded on SAS statistical parameters.
6. Integrate data and programs on a local area network.