CONCLUSION:

1)A number of HD pts is approximating to a plateau.
2)In 1992, a second derivative value, an acceleration degree in a change in a patient number, started declining.
3)In 1999, a first derivative value, a speed in a change in a patient number, started declining while a second derivative value turned negative.
4)Extrapolation indicates that a first derivative value will become negative, which means a decrease in a patient number, will start in 2009.
5) A dynamic mathematical modeling is very useful for detection of fine and precise changes.
6)A possible main reason for above-mentioned changes is due to those in health insurance system in Japan.

INTRODUCTION : Expression that a number of Japanese maintenance hemodialysis patients has been linearly increasing since last about 40 years is doubtful at a glance over a figure for year-patient number relation (Figure 1).

PURPOSE : Usefulness of a newly developed dynamic mathematical analysis of patients number is to be verified.

METHOD :

1)Multiitem approximation formulas showing year (X)   HD pt number (Y) relation, their first (Y') and second (Y'') derivative formulas, are produced by a PC with MS-Excel and presented in tables and figures.

2)A table and figure showing a change in gradient of tangent lines to a 5th degree year-HD pt number approximation curve in various year blocks are presented.

3) Even small changes are analyzed.

RESULTS

1)(Table 1) presents multiitem approximation formulas for shift in HD pt number in various degree(1st to 5th degree).

2)(Table 2 & Figure 2) present different gradients of tangent lines to a year-HD pt number approximation curve in various year blocks.

3)(Figure 3 & 4) reveal that a 5th degree multiitem approximation curve is most adequate to show a year-HD pt number relationship.

4)(Table 3 & Figure 5) show real numbers and imaging curve obtained from 1st derivative value of 5th degree multiitem approximation formula.

5))(Table 4 & Figure 6) show real numbers and imaging curve obtained from 2nd derivative value of 5th degree multiitem approximation formula.

AN INCREASE IN A NUMBER OF JAPANESE MAINTENANCE HEMODIALSIS PATIENTS IS APPROXIMATING TO A PLATEAU

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