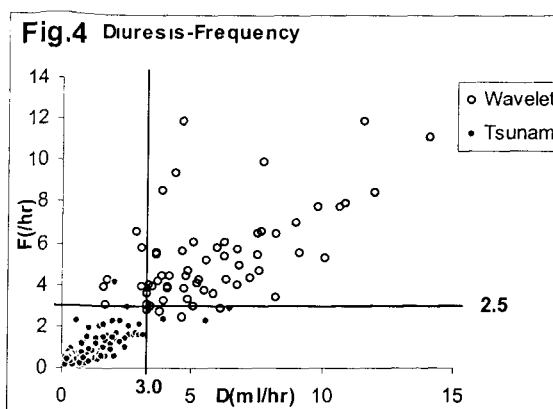
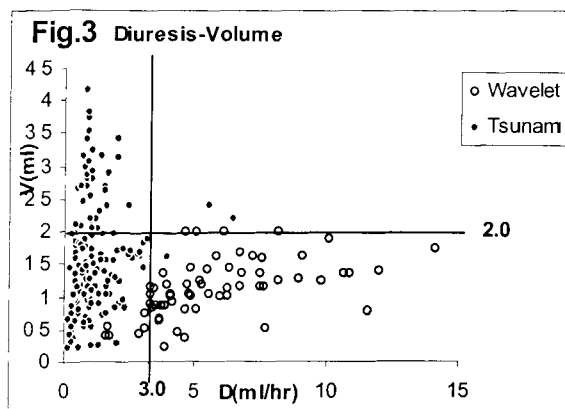
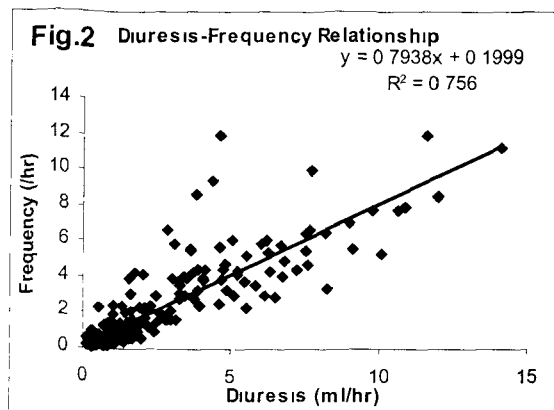
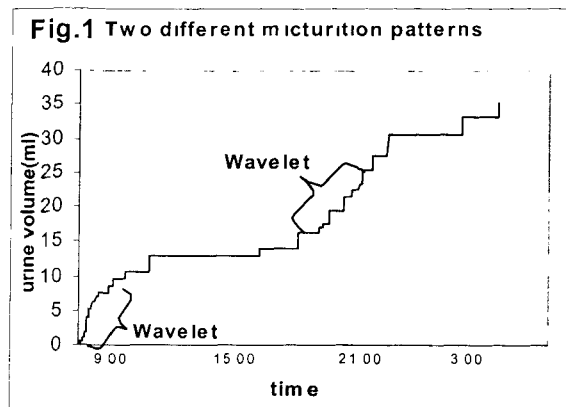


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Title (type in CAPITAL LETTERS, leave one blank line before the text) <b>TWO DIFFERENT MICTURITION PATTERNS OF RAT (TSUNAMI AND WAVELET)</b>  <b><u>Aims of study</u></b> Since the frequency volume (FV) charts is one of the most valuable investigative tools characterizing the lower urinary tract function, their application has become useful in everyday clinical situations. FV charts are also available recently in experimental animals like rats to evaluate the changes of micturition characteristics after treatment. However, there is very little in the literature on what is considered a fundamental micturition pattern of rat. In order to identify this, FV charts of conscious rats were examined and the pattern of micturition were classified as Tsunami and Wavelet.  <b><u>Methods</u></b> 20 male adult SD rats (528±32gm) were used. The rats were placed in metabolic cages with free access to water. Urine from each rat was collected in a container that rested on an electric scale located beneath each cage. The scales were connected to a central PC and the time of micturition and voided volume were recorded for a period of 24 hours. From these recorded data, frequency of urination (F), voided volume corrected for body weight (V) and instantaneous diuresis (D) for each micturition were derived.  <b><u>Results</u></b> Fig. 1 illustrates a typical profile of FV charts over 24 hours. In this figure, a distinctive, sequential, high frequency and low volume micturition pattern can be seen. We termed this pattern "Wavelet" and another pattern "Tsunami" from visual recognition. Wavelet pattern was defined deductively when $F > 2.5/\text{hr}$ and $V > 2.0\text{ml}$ . This pattern was demonstrated in 16 rats among the 20 studied. The total number of micturitions observed in 20 rats was 260 and 65 micturitions (25%) were Wavelet. Fig.2 shows the relationship between D and F, and each plot corresponds to all 260 micturitions. F increased with an

increase in D. Thus, a linear relationship ( $r^2=0.756$ ) between D and F was demonstrated. On the other hand, a significant correlation was not found between D and V (Fig.3). When diuresis(D) exceeded 3.0 ml/hour, 89.9% of micturitions were Wavelet(Fig.3,4). Conversely, when D was less than 3.0 ml/hr, 98.4% of micturitions were Tsunami(Fig.3,4).



### Conclusions

The present study suggests that the frequency of micturition of the rat is primarily a function of the degree of diuresis. However, there are two modes of micturition depending on diuresis. One of them, Tsunami, with low frequencies and varied voided volumes in low diuresis less than 3.0 ml/hr. Other one is Wavelet with high frequency and small volume in high diuretic state over 3.0 ml/hr. It is proposed that the Wavelet-pattern may be a compensatory mode of micturition provoked when acute increase in urinary production occurs to empty the bladder. These observations, if similar in the human, suggest that special attention should be given to diuresis when the FV chart is used for the evaluation of lower urinary tract function.