Surgical site infections (SSI) is a type of hospital-acquired infection that arises following surgery. Patients who develop SSI are more likely to have an extended hospital stay which implies that the cost of their treatment is higher.

There is relatively wide range of non-expensive interventions which may imply the significant reduction of SSI rate. Those include for example the use of antimicrobial sutures [1–5], antibiotics prophylaxis, a safely checked and many other [6] such strategies may both improve the quality of inpatient stay and provide a substantial economic benefit. According to Korean standards of hospitalization and relatively long inpatient stay (compared to European model of treatment) any action that could reduce the length of stay is important and awaited.

### Objectives

The aim of the analysis was to evaluate the burden of surgery site infection (SSI) in common surgeries in Korea. There were three types surgeries considered:

- Gastrointestinal surgery: which was chosen as a representative for high-risk surgery procedure.
- General surgery: which was chosen as a representative for medium risk surgery procedure.
- Orthopaedic surgery: which represent a low SSI-risk procedures.

Within the range of gastrointestinal surgery there were three subtypes analysed: gastric surgery or gastrectomy, colon or bowel surgery, and hepatobiliary surgery. Additionally, within the orthopaedic surgery it was possible to mark out the details for knee and hip replacement separately.

### Methods and data

#### SSI data

Probability of SSI for particular surgeries was obtained on the basis of studies and data collated from the period 2011 to 2013. The obtained data on SSI of within aggregated categories of surgeries defined in the model (general surgery, orthopaedic surgery) was calculated on the basis of all records that were assigned for those aggregated categories (weightby the number of patients). The data on percentage of SSI incidence are stated in the Table 3.

#### Length of stay (LOS)

Data on mean LOS were obtained from data from HIRA [10]. The LOS for particular categories was calculated as the arithmetic mean of LOS for each surgical procedure that belongs to that category. The obtained data on mean LOS for each category are stated in the Table 2 (LOS for General Surgery).

There is statistically significant difference in LOS for patients with and without SSI. According to data from Park KS [14] (as presented in Lee et al. [11]) it is assumed that the SSI prolongs the hospitalisation by 60%. The same increase was then both adopted for General surgery and Orthopaedic surgery.

#### Results

The costs per procedure according to SSI status were estimated assuming the SSI rate – 5% was related to gastric surgery and the lowest SSI rate – 1% to knee replacement. LOS in case of SSI is prolonged for about 60%. According to current data on mean LOS calculation from HIRA [10], the influence of SSI in patients’ procedure burden may be substantial. The estimated increase in hospitalisation cost induced by SSI is about 3.2 million won (724 €) for gastroenterological surgery, 4.3 million won (968 €)/orthopaedic surgery and even 10.3 million won (2276 €) for CABG.

The obtained mean of hospital expenses related to particular surgeries in Korean perspective and between the patients with and without SSI are presented in Table 5.

#### Conclusions

The SSI rate depends mostly on surgery and wound type. However, there is a wide range of evidence that this may impact the effectiveness and quality of operating by reducing the SSI rate without significant additional costs or impediments. Even the SSI rate seems to be too artefactual in many cases according to available data [7–10]. This level of SSI reduction implies that the mean total cost per surgery in Korea would be about 1.5% lower. The value – although it may seem to be relatively low – makes a substantial benefit in the whole health care system. The issue should be considered with a great caution because there are potentially only minor changes, costs and efforts needed to achieve the significant risk reduction.

### Summary

#### Objective

To evaluate the burden of SSI (surgery site infection) in common surgeries in Korea. The considered surgeries: gastrointestinal surgery, General surgery, and Orthopaedic surgery. The influence of SSI depends on surgery type. Among the procedures considered, the risk of SSI rate – 5% was related to gastric surgery and the lowest SSI rate – 1% to knee replacement. LOS in case of SSI is prolonged for about 60%.

#### Costs

Costs of hospitalisation were calculated on the basis of data from Health Insurance Review and Assessment Service – HRAS [10]. The costs are presented in Table 3.

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